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**PHASE I
RCRA FACILITY INVESTIGATION
REPORT**

Revision 1.0

LAUFEN



Prepared for:

LAUFEN INTERNATIONAL INC.

EAST SPARTA, OHIO

CEC Project 060770

January 2007

Volume 1 of 2

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CERTIFICATION STATEMENT

PHASE I RCRA FACILITY INVESTIGATION REPORT

JANUARY 31, 2007

CONSENT DECREE CASE NO. 5:04-CV-02394-JG

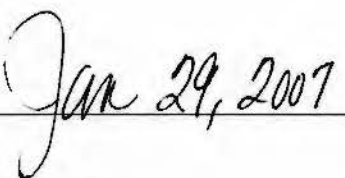
"I, David Reader, certify that his document and all attachments were prepared under my direction or supervision in accordance with a system designed to evaluate the information submitted. I certify that the information contained in or accompanying this submittal is true and complete. As to the those portions (s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the information, or the immediate supervisor of such person (s), the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



Signature

David Reader
Name

Vice President, Manufacturing
Title



Date

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GLOSSARY OF ACRONYMS, TERMS AND SAMPLE NOMENCLATURE

AOI	Area of Interest
CEC	Civil & Environmental Consultants, Inc.
DQO	Data Quality Objective
FSAP	Field Sampling and Analysis Plan
ICP	Inductively Coupled Plasma Spectrometry
IHS	Initial Hydrogeologic Study
QAPP	Quality Assurance Project Plan
RFI	RCRA Facility Investigation
RPD	Relative Percent Difference
TDL	Target Decision Level (as specified in Appendix A of Work Plan)
U.S. EPA	United State Environmental Protection Agency
WWTP	Wastewater Treatment Plant

General Sample Nomenclature

(AOI) – (Sample Type) – (Unique, sequential number) – (Depth {where appropriate})

Nomenclature for Sample Type

Comp	Composite sample
CS	Fill/Waste Composite Surficial Sample (Grid samples)
DS	Discrete Fill/Waste Sample
PZ	Piezometer/Monitoring Well
SB	Soil Boring
SS	Surface Soil
SW	Surface Water Sample
SED	Sediment Sample
SEEP	Seep and/or Soil associated with Seeps
TEMP	Temporary Well
TP	Test Pit Sample

Exceptions to Sample Nomenclature

- 5-7-SS-4 Discrete (grab) surface soil sample collected from AOI 5-7
- 5-7-SS-5 Discrete (grab) surface soil sample collected from AOI 5-7
- ADD-SW-1 Additional surface water sample (northwest of AOI 5-10)
- ADD-SED-1 Additional sediment sample (northwest of AOI 5-10)

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1.0 INTRODUCTION

This document comprises the written report for the Phase I RFI conducted at the Laufen International, Inc. (Laufen) (formerly the United States Ceramic Tile Company) manufacturing plant located in East Sparta, Ohio. The investigation was performed by Civil & Environmental Consultants, Inc. (CEC) on behalf of Laufen.

The Laufen Facility is located at 10233 Sandyville Road, S.E. in East Sparta, Pike Township, Stark County, Ohio (Figure 1). The Laufen plant and associated property owned by Laufen in East Sparta currently consists of approximately 733 acres. Most of the parcels are contiguous and are included as part of the RFI study area. As detailed in the U.S. EPA approved Phase I RFI Work Plan (June 2006), there are nine AOIs that are the focus of the Phase I investigation. The AOIs are shown on Figure 2 and listed in Table 1. Most of the AOIs consist of excavated areas that were formerly mined for clay or shale and are suspected to have been back-filled with mine spoil and/or reject tiles.

The purpose of the Phase I RFI was to: 1) determine the chemical and physical characteristics of the fill materials within the AOIs, and 2) determine if there has been a release from the AOIs to environmental media. To determine the absence or presence of a release, the chemical data for samples collected from the environmental media (soil, groundwater, surface water and sediments) were compared to generic human health and ecological screening levels.

An Initial Hydrogeologic Study (IHS), included in Appendix A, was conducted at the Facility as part of the Phase I RFI activities. The purpose of the IHS was to:

- better define groundwater occurrence in unconsolidated materials in the vicinity of, or within the AOIs;
- evaluate the hydraulic relationship between the shallow groundwater and surface water where such groundwater and surface water occurs in these materials;
- aid in the determination of monitoring well placement locations prior to mobilization for those efforts as part of Phase I of the RFI;
- determine the absence or presence of seeps that may require investigation during Phase I of the RFI;

- provide a preliminary indication of the probable direction of groundwater flow in the saturated unconsolidated materials; and
- determine the elevations of the surface water bodies near the AOIs to evaluate the influence of surface water on the potential migration of contaminants from the AOIs.

Laufen prepared and submitted the report summarizing the results of the IHS to U.S. EPA in November 2006. Although the report was previously submitted under separate cover, the results and findings of the IHS are contained within this report in summary or reference form and a complete copy of this report is included in Appendix A.

2.0 SUMMARY OF WORK PERFORMED

The Phase I RFI was conducted in accordance with the approved Work Plan (June 2006) with the exceptions noted in the following sections. The field sampling and analysis program was conducted in accordance with Appendices A (QAPP) and B (FSAP) of the approved Work Plan.

Samples were collected from a variety of environmental media associated with each of the AOIs including surface soils and fill materials, subsurface soils and fill/waste materials, surface water, sediments and groundwater. Test pits and soil borings were installed to facilitate the collection of subsurface soils and fill materials. Temporary and permanent monitoring wells were installed to facilitate the collection of groundwater samples. A summary of the sampling program is provided in Table 2.

All of the samples were submitted for chemical analysis to Tri-Matrix Laboratories in accordance with the methods and procedures specified in the approved RFI Work Plan. Copies of the laboratory summary reports are included in Appendix B.

All of the laboratory data was validated by Validata Chemical Services, Inc. (Validata) of Duluth, GA. Copies of the summary validation reports are included in Appendix C. Scanned copies of the following documents is included in Appendix D on CD-ROMs:

- Tri-Matrix CLP-like data packages including laboratory QC information and raw data; and,
- Validata data validation reports including qualified data Form I's.

The Phase I RFI activities also included an evaluation of the wastewater treatment plant (WWTP) in-use at the Laufen tile manufacturing plant (AOI-6). The WWTP was evaluated by a Professional Engineer in accordance with the procedures and methods provided in the approved Phase I RFI Work Plan. The results of the evaluation are presented in Section 3.3.3.10.

2.1 SURFACE FILL/WASTE CHARACTERIZATION SAMPLES

The surface systematic (unbiased) composite grid samples were collected within the footprint of each AOI for the purpose of waste and unit characterization and to determine if the fill materials present at land surface within the AOIs exceed the generic screening levels established in the

RFI Work Plan. These samples were intended to yield the most representative results of the AOI while covering large surface areas. Discrete surface samples were also collected; biased to include only fine-grained material whenever encountered. A total of 71 surface fill/waste grid samples, both composite and discrete, were collected from the AOIs between May 31 and June 27, 2006. A summary of the samples collected within each AOI are provided on an AOI-specific basis in Table 2 and Figures 3 through 10.

The surface fill/waste samples were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-01-04, located in Appendix A-1 of the RFI Work Plan. Sampling logs documenting field collection techniques, measurements and/or observations were prepared to each sample location. Copies of the logs are provided in Appendix E.

In addition to the work specified in the RFI Work Plan, two additional discrete samples were collected from AOI 5-7, in response to a request made by the U.S. EPA during a visit to the facility on June 27, 2006. An additional grid (#15) was added on the east side of AOI 5-4 (see Figure 5). An additional grid (#3) was also added on the north side of AOI 5-9 (see Figure 9).

2.2 SUBSURFACE FILL/WASTE CHARACTERIZATION SAMPLES

Soil borings were drilled and/or test pits were excavated within the AOIs to facilitate the collection of subsurface samples of the fill/waste materials to aid in determining the nature and vertical extent of the fill/waste materials and to provide a physical and chemical characterization of the fill/waste materials. A total of 31 subsurface fill/waste samples were collected from the AOIs for chemical characterization. An AOI-specific breakdown of the samples collected is shown on Table 2 and Figures 3 through 10. Boring logs and test pit logs showing the subsurface conditions encountered at each location are contained in Appendix F.

The subsurface fill/waste samples associated with the soil borings and test pits were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-01-01 and CEC SOP 03-01-03, respectively (please see Appendix A-1 of the RFI Work Plan).

2.2.1 Soil Borings

The RFI Work Plan specified that, during drilling of the soil borings, at least one subsurface composite sample of the fill/waste material was to be collected from each AOI. Subsurface composite samples of the fill/waste materials were not collected from four (4) of the AOIs due to

the lack of fine-grained matrix and/or encountering the water table or saturated conditions. As provided for in Section 7.2 of the FSAP, samples that would consist only of scrap fired tile were not to be collected. The temporary monitoring wells were installed in accordance with CEC SOP 02-02-06.

2.2.2 Test Pits

The RFI Work Plan specified that, during excavation of the test pits, one subsurface composite sample of the fill/waste material was to be collected per five foot interval. However, only one subsurface composite sample of the fill/waste materials was collected from each test pit. As described in Section 2.2.1, samples that consisted only of scrap fired tile with no fine-grained matrix were not collected, nor were samples collected from below the water table.

2.3 SURFACE SOIL SAMPLES/RELEASE INVESTIGATION

The judgmental (biased) samples were collected in areas outside the footprint of selected AOIs to determine if storm water runoff had acted as a preferential release mechanism from the fill/waste materials to surface soil. A total of 25 surface soil samples were collected from the AOIs on June 6 and 7, 2006 at the pre-determined locations provided in the approved RFI Work Plan. An AOI-specific breakdown of the samples collected is shown on Table 2 and Figures 3 through 10.

The surface soil samples were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-01-04, located in Appendix A-1 of the RFI Work Plan. Field sampling activities were documented on the forms included in Appendix E.

2.4 SUBSURFACE SOIL SAMPLES/RELEASE INVESTIGATION

Soil borings were drilled and/or test pits were excavated within the AOIs to facilitate the collection of subsurface soil samples laboratory analysis and determine if there has been a release of the COPI to the soils underlying the fill/waste materials of the AOIs. A total of 58 subsurface soil samples were collected from the AOIs between June 13 and June 26, 2006. Soil boring logs and test pit logs showing the subsurface conditions encountered at each location are contained in Appendix F. An AOI-specific breakdown of the samples collected is shown on Table 2 and Figures 3 through 10.

The subsurface samples associated with the soil borings and test pits were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-01-01 and CEC SOP 03-01-03, respectively (please see Appendix A-1 of the RFI Work Plan).

2.5 SURFACE WATER SAMPLES/RELEASE INVESTIGATION

Surface water samples were collected from locations adjacent to or within selected AOIs at the Facility as described in the approved RFI Work Plan to determine the absence or presence of a release from the AOIs. Between June 7 and June 28, 2006, a total of 26 surface water samples were collected from the surface water bodies. An AOI-specific breakdown of the samples collected is shown on Table 2 and Figures 3 through 10.

In addition to the sample locations described in the approved RFI Work Plan, one additional surface water sample (5-7-SW-3) was collected at AOI 5-7 at a location hydraulically upstream from the two identified seeps adjacent to the AOI (see Figure 8). A surface water sample (ADD-SW-1) was collected from a location northwest of AOI 5-10 as requested by the U.S. EPA during a visit to the Facility on June 27, 2006 (see Figure 10). One (1) surface water sample location, on top of the high wall on the west side of AOI 5-6, was omitted, along with its corresponding sediment sample, due to the lack of surface water present at the time of the investigation.

The surface water samples were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-04-01, located in Appendix A-1 of the RFI Work Plan. Field sampling activities were documented on the forms included in Appendix E.

2.6 SEDIMENT SAMPLES/RELEASE INVESTIGATION

Co-located sediment samples were collected in conjunction with the surface water sampling program, conducted as part of the Phase I RFI at the Facility. Between June 7 and June 28, 2006, a total of 25 sediment samples were collected from the surface water bodies and locations specified in the approved RFI Work Plan. An AOI-specific breakdown of the samples collected is shown on Table 2 and Figures 3 through 10.

The sediment sampling location on the east side of AOI 5-4 exhibited a lack of suitable material to make collection of a sample practicable; therefore, a sample was not collected at this location (a surface water sample, 5-4-SW-1, was still collected at this location, see Figure 5). Sediment sample (5-7-SED-3) was co-located with the additional surface water sample at AOI 5-

7 that was collected hydraulically upgradient of the two seeps (see Section 2.5 and Figure 8). Sediment sample (ADD-SED-1) was co-located with the additional surface water sample collected northwest of AOI 5-10 (see Section 2.5 and Figure 10). One sediment sample location, on top of the high wall on the west side of AOI 5-6, was omitted, along with its corresponding surface water sample, due to the lack of water present at the time of the investigation.

The sediment samples were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-04-03, located in Appendix A-1 of the RFI Work Plan. Field sampling activities were documented on the forms included in Appendix E.

2.7 SEEP SAMPLES/RELEASE INVESTIGATION

Several seeps were identified at the Facility at locations adjacent to AOIs 5-7 & 5-10. Each of the seeps was investigated as a potential release mechanism from the AOIs. A total of five (5) seep samples were collected from the AOIs between June 27 and August 9, 2006. Subsequent to the preparation of the RFI Work Plan, an additional seep was identified to the northwest of AOI 5-5. An additional seep sample (5-5-SEEP-1) was collected at this location (see Figure 6). An AOI-specific breakdown of the samples collected is shown on Table 2 and Figures 6, 8 and 10.

The seep samples were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-02-04, located in Appendix A-1 of the RFI Work Plan. The seep sampling location in AOI 5-10 was re-sampled to confirm what appeared to be anomalous laboratory analytical results from the first sampling event.

Soil samples associated with the seeps were collected in conjunction with the seep sampling event. A total of five (5) soil samples associated with the seeps were collected from the AOIs between June 27 and August 9, 2006. Soil sample 5-5-SEEP-1 was collected at the location of the additional seep located near AOI 5-5 (see Figure 6). An AOI-specific breakdown of the samples collected is shown on Table 2 and Figures 6, 8 and 10.

The soil samples associated with the seeps were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-01-05, located in Appendix A-1 of the RFI Work Plan. TriMatrix required the collection and submission of two (2), five (5) gram EnCore samplers, one (1), 25 gram EnCore sampler and one (1), eight (8) ounce, wide-mouth jar from each sampling location.

The soil sampling location associated with the seep in AOI 5-10 was re-sampled to confirm what appeared to be anomalous laboratory analytical results from the first sampling event.

2.8 GROUNDWATER RELEASE INVESTIGATION

Groundwater samples were collected from the four monitoring wells (PZ-1 through PZ-4), three temporary wells (5-5-TEMP-WELL, 5-7-TEMP-WELL & 5-9-TEMP-WELL) and two existing wells (TW-2 & TW-3). Prior to sampling, all of the wells were properly developed using a disposable bailer and submersible pump in accordance with CEC SOP 02-02-04, located in Appendix A-1 of the RFI Work Plan. Groundwater samples were collected from the nine locations listed above between June 28 and November 9, 2006. Soil boring logs showing the subsurface conditions encountered at each location, and well construction diagrams are contained in Appendix F. An AOI-specific breakdown of the samples collected is shown on Table 2 and the locations of the wells are shown on Figures 3 through 6 and Figures 8 through 10.

The groundwater samples were collected, preserved, shipped and analyzed in accordance with CEC SOP 03-02-05 (please see Appendix A-1 of the RFI Work Plan).

2.9 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Two (2) types of field quality assurance/quality control samples were collected during the sampling program described in the previous sections: equipment rinse blanks and field duplicate samples. The following discussion provides a description of each of these samples and their corresponding frequency of collection.

2.9.1 Equipment Rinse Blanks

Equipment blanks were collected to verify the adequacy of equipment decontamination efforts and to identify the potential for cross-contamination between sample locations. For each media where appropriate, equipment blanks were collected at a rate of one sample per ten (10) environmental samples. Equipment blank samples were not collected where disposable sample equipment was used. Equipment blanks were collected by pouring laboratory-grade deionized water over the soil sampling equipment into the sample containers following decontamination of the equipment (see CEC SOP 04-01-01). Equipment blank samples were analyzed for the same parameters as the associated environmental samples.

2.9.2 *Field Duplicates*

Field duplicates were collected to evaluate the precision of sample collection and laboratory analysis procedures and the comparability of analytical data. For soil samples, field duplicate samples were collected from the same representative soil volume as the original sample. The field duplicates were analyzed for the same constituents as the respective soil samples. Field duplicate samples were collected at a frequency of one per every ten (10) samples.

3.0 FINDINGS

The findings related to the Phase I RFI activities, including a summary of findings from the DOCC Report and the IHS, are provided in the following section.

3.1 ENVIRONMENTAL SETTING

3.1.1 *Geologic Setting*

The following section presents a description of the regional geology of the unconsolidated materials in the vicinity of the Laufen Facility. The information is based on published literature, publicly available well records, and reports of previous investigations for the Facility. This is followed by a description of the site-specific geologic setting, based on information gathered from previous reports and the results of the IHS and Phase I RFI work tasks.

3.1.1.1 Regional Geology

Stark County lies within two subdivisions of the Appalachian Plateau Physiographic Province. The northern two-thirds of the county lie in the glaciated section of the Appalachian Plateau, while the rest of the county (and the Laufen facility) is within the unglaciated section. The county has undergone glaciation twice, during the Illinoian and Wisconsinan glacial advances.

Stark County has more diverse glacial deposits than any other county in Ohio, and is where two glacial lobes (Grand River Lobe and Killbuck Lobe) converged. The glacial deposits within the county vary from kame, kame terraces, outwash deposits, glacial end, hummocky and ground moraine deposits comprised of Kent Till, Titusville Till, Navarre Till, Astabula Till and Lavery Till laid down during the Wisconsinan glacial stage, and Mapledale Till laid down during the Illinoian glacial stage. The glacial deposits can be as thick as 200 feet in buried bedrock valleys and can be as thin as five feet thick in the uplands (White, 1982).

3.1.1.2 Site-Specific Geology – Unconsolidated Deposits

The identification of the unconsolidated units at the Facility are based on the results of the soil borings drilled around the property area during previous investigations, the IHS, and the Phase I RFI subsurface investigation. Appendix F contains drilling logs for all soil borings installed during the Phase I RFI activities, including those associated with the IHS.

Previous studies (Dames & Moore, 1988) identified three major types of unconsolidated materials that overlie bedrock at the Facility:

Mine spoil: These materials consist of brown or gray silty clay with some sand and gravel, and fragments of rock (coal, shale, and sandstone). Because the material was re-worked, it is heterogeneous and varies in thickness. The mine spoil was observed by Dames & Moore in soil samples collected during the drilling performed adjacent to the former settling basin and existing landfill.

Alluvial (floodplain) sediments: These materials consist of brown silty clay and sandy clay with some pebbles. Unlike the mine spoil, these sediments are stratified and do not appear to be disturbed. These soils were found near the surface at soil borings drilled under the supervision of Dames & Moore at locations adjacent to, or within, the former settling basin.

Residual soils: These sediments consist of olive brown silty clay and clayey silt with pieces of shale when overlying shale bedrock, and tan silts with some sand when overlying sandstone bedrock. These soils were observed by Dames & Moore close to the transition between the unconsolidated deposits and bedrock surface.

Of the three types of unconsolidated materials identified above by Dames & Moore, mine spoil was the predominant material encountered during the implementation of the IHS and the Phase I RFI subsurface investigation. Consistent with the type of materials identified during previous studies, the mine spoil materials encountered during drilling were comprised of brown or gray intermixed silt and clay with fragments of rock (coal, shale, and sandstone) and occasional fragments of tile. During drilling within the footprint of each of the AOIs, tile fill/waste material was continuously sampled for logging and analytical characterization purposes. The tile fill/waste material was mainly comprised of gray clay with some silt, and mine spoil, both with intermixed tile.

Several generalized geologic cross-sections (Figures 11 through 21) were prepared to illustrate the relative nature and depth of the subsurface materials encountered at each of the AOIs, and to show the relationship of the unconsolidated materials encountered, to the underlying bedrock and other features on the Facility property. These cross-sections are based on the results of the test pit and boring installations completed as part of the Phase I RFI activities.

3.1.2 Hydrogeologic Setting

The following section presents a description of the regional hydrogeology in the vicinity of the Facility. The information is based on published literature, publicly available well records, and reports of previous investigations conducted for the Facility. This is followed by a description of the site-specific hydrogeologic setting, based on information gathered from previous reports and the results of the IHS and Phase I RFI work tasks.

3.1.2.1 Regional Hydrogeology

Several principal water-bearing formations are utilized in Stark County for municipal, industrial, and private water supplies. These water-bearing units include deep glacial buried river valleys; inter-bedded and inter-lensing sand, gravel, silt and clay in glacial moraine deposits; valley fill containing sand and gravel deposits of limited thickness and extent; discontinuous bodies of sand and gravel in thick glacial till drift; and, alternating layers of sandstones and sandy shales of the Pottsville and Allegheny Groups of the Pennsylvanian System. County-wide water well yields range from 3 gallons per minute (gpm) from sandstone/shale units to over 2,000 gpm from buried river valley sand and gravel deposits.

In Pike Township groundwater is drawn from two principal water-bearing geologic formations; bedrock formations, and valley fill deposits associated with erosion along existing surface water bodies. The bedrock water-bearing units consist of the alternating layers of sandstone and shale of the Allegheny and Pottsville groups. A maximum reliable yield for these units is about 25 gpm. Valley fill containing sand and gravel deposits are present along the present-day drainage of Nimishillen Creek, Limestone Creek, and Bear Run. These unconsolidated deposits range from 10 to 160 feet in thickness and can produce sustainable yields ranging from approximately 10 to 30 gpm.

3.1.2.2 Site-Specific Hydrogeology – Unconsolidated Deposits

Prior to the RFI, little information had been gathered with regard to the occurrence and movement of groundwater within the unconsolidated deposits at the Facility, with the exception of the hazardous waste landfill and former settling basin area. As described in the Description of Current Conditions Report (DOCC) (November 2005), previous studies conducted at the Facility included drilling soil borings completed in the unconsolidated materials around the perimeter of the hazardous waste landfill, and around or within the former settling basin. In these borings,

shallow groundwater was identified in the unconsolidated materials that consist of both alluvial sediments and mine spoil materials. The location and occurrence of groundwater in this portion of the Facility indicated the presence of a laterally continuous groundwater-bearing zone. Groundwater monitoring wells were installed at various locations as part of landfill closure and monitoring activities. These wells continue to be monitored as part of the Interim Measures – Area-Specific Risk Assessment.

No previous evaluation of the occurrence and/or movement of groundwater in the unconsolidated materials was conducted for the portions of the Facility located west of Sandyville Road, which constitutes the majority of the Facility that is the subject of the RFI. The unconsolidated materials in this portion of the Facility are at a significantly higher elevation than those in the area of the hazardous waste landfill and former settling basin. As a precursor to conducting a groundwater investigation at the Facility, an Initial Hydrogeologic Study (IHS) was conducted in May through August 2006. The purpose of the IHS, located in Appendix A, was to determine the occurrence and movement of groundwater in the unconsolidated deposits in the portion of the Facility where the AOIs are located.

During the IHS, soil borings were drilled into and through the unconsolidated materials at four study areas, as described in Section 3.1 of the IHS report. The unconsolidated materials observed during the drilling program consisted primarily of re-worked mine spoil materials. The results of the drilling program showed that there is no continuous water-bearing zone in the unconsolidated materials in the upland portions of the Facility located to the west of Sandyville Road. Shallow groundwater was encountered at isolated locations, including AOI 5-3, AOI 5-4, AOI 5-5, AOI 5-7, AOI 5-9 and AOI 5-10. However, even within these areas, the occurrence of groundwater in the unconsolidated materials was not laterally continuous. A total of four piezometers (PZ-1 through PZ-4) and three temporary wells (5-5-TEMP WELL, 5-7-TEMP WELL and 5-9-TEMP WELL) were installed as part of the IHS and Phase I RFI activities.

Measurements of groundwater levels in the piezometers and temporary wells were collected in July and August 2006. All of the measurements were referenced to the top of inner PVC well casing, for which survey elevations had been established in feet above msl. Table 3 of the IHS Report summarizes the groundwater level measurements and calculated groundwater elevations for the piezometers, temporary wells and monitoring wells TW-2 and TW-3. The locations of the monitoring points and groundwater elevations, and their relationship to the general site

topography are shown on Figure 6 of the IHS Report. In general, the groundwater elevations mimic the topographic expressions, with the highest groundwater elevation occurring on the western portion of the study area (AOI 5-7) and the lowest groundwater elevations occurring on the southeastern portion of the property near AOI 5-3 (TW-2 and TW-3). Because the occurrence of groundwater in the unconsolidated materials is not laterally continuous across the Facility, no discernible pattern of groundwater flow can be concluded that would indicate hydraulic connectivity between these areas.

3.1.3 Hydrology

3.1.3.1 Regional Hydrology

Three major watersheds lie within Stark County: the Tuscarawas River, the Mahoning River and the Cuyahoga River. The Tuscarawas River system drains most of Stark County. The Tuscarawas River, originating in southern Summit County, flows generally southward through Stark and Tuscarawas Counties before turning to the west and joining the Walhonding River in Coshocton County forming the confluence of the Muskingum River. Portions of the Mahoning Rivers headwaters originate in northeastern Stark County. These waters flow northeast through southeastern Portage County, northwestern Mahoning County before turning to the southeast in Trumbull County. The Mahoning River then joins the Shenango River forming the confluence of Beaver River in western Pennsylvania which in turn discharges to the Ohio River. The northern portion of Stark County lies within the Cuyahoga River watershed. The Cuyahoga River flows generally northward through Summit and Cuyahoga Counties where it ultimately discharges to Lake Erie.

The Laufen Facility lies within the Nimishillen Creek watershed system which is a tributary of Sandy Creek, which in turn drains to the Tuscarawas River. Nimishillen Creek drains the central portion of the county, and Sandy Creek drains southeastern Stark County. Southwestern Stark County is drained by Sugar Creek, another tributary of the Tuscarawas River.

According to the USGS Water Resources Division website (<http://waterdata.usgs.gov>), the average stream flow recorded in 2005 at the Tuscarawas River gauging station at Massillon, Ohio, approximately 12 miles northwest of the Laufen Facility (upstream), is 721.2 cubic feet per second (cfs). The Middle Branch of Nimishillen Creek gauging station in Canton, approximately 11 miles north of the Laufen Facility (upstream) recorded an average stream flow

for 2005 of 68.6 cfs. The average stream flow recorded in 2005 at the Sandy Creek gauging station at Waynesburg, Ohio, approximately 6 miles east/northeast of the Laufen Facility, is 407.0 cfs. The 2005 average stream flow at the Nimishillen Creek gauging station in North Industry, located approximately 5 miles north of the Laufen Facility (upstream), is 332.7 cfs.

3.1.3.2 Site-Specific Hydrology

The Facility is located to the west of Nimishillen Creek which discharges into Sandy Creek just south of Sandyville, Ohio. Sandy Creek discharges into the Tuscarawas River approximately four miles to the west of the Laufen Facility near Bolivar, Ohio.

There is a topographic and hydraulic divide running north and south generally following Ridge Avenue through the central portion of the entire Facility property (see Figure 1). Surficial topography generally slopes, and surface water drains, to the east or west along this divide. The RFI focuses entirely on the areas located to the east of Ridge Avenue, and does not include the areas located to the west of Ridge Avenue.

Previous studies indicated that the natural hydrologic setting on the Facility site has been modified significantly by railroad and highway construction, strip mining activities, and stream channelization. These activities have altered the original infiltration and surface runoff patterns in the vicinity of the Facility. In the absence of local man-made influences (i.e., storm water sewers, ditches, mine pits), it was assumed that the majority of the surface water runoff in the RFI study area flows eastward toward the tributaries or the main body of Nimishillen Creek.

There are several unnamed tributary streams that originate within the Facility. In general, these unnamed tributaries flow from the northwest to the southeast and discharge into on-site wetlands, ponds, or other unnamed tributaries. The majority of these headwater streams feature high gradient channels located in forested areas. The ephemeral and intermittent sections of stream typically have very small upstream drainage areas. The stream banks along the unnamed tributaries are moderately incised, well vegetated and, for the most part, stable. The substrate within the unnamed tributaries mainly consists of cobble, gravel, sand, silt and fine sediment.

There are numerous surface water bodies located throughout the property, the majority of which have been created as a result of historic mining operations and/or fill placement in the downstream sections of the low-lying areas and/or streams. Those ponds that lie near or adjacent

to the AOIs and were subject to investigation as part of the Phase I RFI were designated with identifiers A through F as indicated on Figure 2 of the IHS Report. The downstream embankments were constructed from mine spoil, overburden, and/or reject tile. Un-reclaimed highwalls or mine spoil piles were observed near several of these open water areas.

Surface water level measurements were collected from the staff gauges installed in the surface water bodies, as described in Section 3.3, during July and August of 2006, approximately 30 days apart. The surface water measurements and calculated water-level elevations are summarized in Table 4 of the IHS Report. The locations of the monitoring points and surface water elevations, and their relationship to the general site topography are shown on Figure 7 of the IHS Report. The collected measurement information indicates that the elevations of the surface water bodies demonstrated some variability between the two monitoring events, and that in general, the surface water is at higher elevations on the western side of the study area than those on the eastern side indicating that the overall surface water drainage follows the topographic expression from northwest to southeast.

As indicated previously, the streams in the study area flow eastward, mostly terminating in and recharging the upland on-site surface water features (ponds A through F, Figure 2). Observations and measurements of water surface during the field activities showed that the surface water levels in these ponds maintain a fairly consistent elevation throughout the year, yet generally none of them were observed to have an observable downstream outlet. This indicates that the ponds maintain their equilibrium by discharging either evapotranspiration and/or infiltration into the subsurface, possibly through preferential pathways in the subsurface materials. Several of the soil borings were installed during the IHS with the intention of installing piezometers and/or groundwater monitoring wells to be used in determining surface water/groundwater interaction and connectivity, but in most cases, groundwater was not encountered in the borings and therefore no such connectivity was able to be identified.

3.2 MAN-MADE FEATURES THAT MAY AFFECT THE MIGRATION OF CONTAMINANTS

3.2.1 *Changes in Geomorphology*

The native landforms in the RFI Facility study area have undergone substantial alterations as a result of human activity, primarily the historic mineral (clay and shale) mining. These activities included the removal of vegetative cover, the installation of roads and stormwater conveyance

ditches, soil and rock excavations and subsequent backfilling with mine spoil and waste materials, and reclamation (grading, filling and revegetation, etc.). These alterations have undoubtedly changed to natural flow characteristics of surface and groundwater, and therefore would affect the migration of contaminants from any source areas. The iterative and long-term nature of the operations at the Facility preclude specificity with regard to the ability to make a direct comparison of pre-development conditions versus current conditions.

3.2.2 Pipelines and Underground Conduits

There are also subsurface pipelines that traverse the Facility property, notably a natural gas line running generally northwest-southeast along the access road north of AOIs 5-9 and 5-10, and south of AOI 5-4. The gas line has surficial markers that show the approximate location of the subsurface line. There is an underground concrete pipe that is visible at the rear (west) of the tile manufacturing building that conveys water eastward under the building towards Sandyville Road.

3.2.3 Groundwater Industrial Supply Wells

The plant utilizes several groundwater production wells **Non responsive** which during pumping, have been shown to influence the groundwater flow conditions near the hazardous waste landfill. Information regarding the production wells is **Non responsive**. Based on the isolated occurrence and location of groundwater in the unconsolidated deposits in areas west of Sandyville Road, the production wells are not interpreted to be capable of influencing groundwater conditions in those areas.

3.3 AOI CHARACTERIZATION

3.3.1 Unit and Waste Characterization

The lateral extent of the fill/waste materials associated with each of the AOIs was determined in the field using a combination of visual observation of the apparent waste on the ground surface, and the installation of shallow borings around the AOIs with a hand auger. The thickness of the fill/waste materials was evaluated as part of the RFI field activities through the installation of test pits and test borings inside the footprint of each of the AOIs. Rough estimates of the volume of fill/waste for each of the AOIs were calculated by multiplying the surface area times the average depth of fill/waste materials encountered in the test pits and borings. The surface area and

footprint of the AOIs is shown on the AOI-specific figures included in the following subsections. Calculated volume estimates are included in each AOI-specific subsection.

Surface and subsurface samples of the fill materials were collected from within each of the AOIs in order to characterize the waste/fill materials within each AOI. The samples were both visually inspected and screened in the field, and submitted for chemical analysis to determine the chemical composition of the waste/fill materials with regard the COPI established for Phase I of the RFI. Results specific to each AOI are provided in the following subsections.

3.3.2 Absence or Presence of a Release from the AOIs

Numerous samples, from a variety of media, were collected from outside the footprint and beneath each of the AOIs. Once all of the samples were analyzed, the analytical data from the samples collected outside of the approximate fill limits at each of the AOIs was used in determining if there has been a previous or ongoing release of hazardous constituents to the environment. The following provides a brief summary of the constituents found in and adjacent to each AOI. Detailed information can be found in Tables 3 through 57.

3.3.3 AOI-Specific Characterization Results

3.3.3.1 AOI 5-1

The location, configuration, features and sample locations related to AOI 5-1 are shown on Figure 3. A geologic cross-section of the area is shown on Figure 11. Waste/Fill characterization results are shown on Tables 3 and 4. Release sample analytical results are summarized in Tables 5 through 8.

Unit/Waste Characterization

- Surface Area: 2.93 Acres
- Observed Thickness of Waste/Fill: 1 to 14 feet
- Calculated Estimated Volume of Waste/Fill: 33,000 cubic yards (yd³) (using average thickness of 7 feet)
- Containment barrier: None

The waste/fill materials encountered at AOI 5-1 consisted of gray and brown clay with intermixed silt and tile. Scrap fired tile was identified at land surface and in some piles on land

surface at various locations within the AOI. Chemical characterization of the surface and subsurface waste/fill materials indicated that all 17 of the metal COPI were present in the materials at varying concentrations. Barium, lead and zinc were present at the highest concentrations with maximum values in subsurface samples of 900, 1300 and 3200 milligrams per kilogram (mg/kg), respectively.

Surface Soil Samples (five samples)

- All five surface soil samples exceeded the Human Health TDL for arsenic
- All five surface soil samples exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Subsurface Soil Samples (nine samples)

- Seven subsurface soil samples exceeded the Human Health TDL for arsenic.
- One subsurface soil sample exceeded the Soil Screening Level for chromium.
- All nine subsurface soil samples exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Surface Water Samples (three samples)

- Two surface water samples exceeded the Human Health TDL for mercury.
- The laboratory reporting limit for mercury was higher than the Human Health TDL for one surface water sample.
- All three surface water samples exceeded the applicable Ecological TDL for lead.
- The laboratory reporting limit for silver was higher than the Ecological TDL for two of the three surface water samples.
- One of the three surface water samples exceeded the Ecological TDL for zinc.

Sediment Samples (three samples)

- One of the three sediment samples exceeded the Human Health TDL for arsenic.
- All three sediment samples exceeded one or more of the applicable Ecological TDLs for selected inorganic COPI.

3.3.3.2 AOI 5-3

The location, configuration, features and sample locations related to AOI 5-3 are shown on Figure 4. A geologic cross-section of the area is shown on Figure 12. Waste/Fill

characterization results are shown on Tables 9 and 10. Sample analytical results are summarized in Tables 11 through 14.

Unit/Waste Characterization

- Surface Area: 2.19 Acres
- Observed Thickness of Waste/Fill: 0.5 to 14 feet
- Calculated Estimated Volume of Waste/Fill: 25,000 yd³ (using average thickness of 7 feet)
- Containment barrier: None

The waste/fill materials encountered at AOI 5-3 consisted of mine spoil with intermixed tile. Chemical characterization of the surface and subsurface waste/fill materials indicated that all 17 of the metal COPI were present in the materials at varying concentrations. Barium, lead and zinc were present at the highest concentrations with maximum values in surface samples of 1100, 280 and 730 mg/kg, respectively.

Surface Soil Samples (five samples)

- All five surface soil samples exceed the Human Health TDL for arsenic.
- All five surface soil samples exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Subsurface Soil Samples (six samples)

- Four of the six subsurface soil samples exceed the Human Health TDL for arsenic.
- All six subsurface soil samples exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Surface Water Samples (six samples)

- One of the six surface water samples exceeded the Human Health TDL for mercury.
- The laboratory reporting limit for mercury was higher than the Human Health TDL for five of the six surface water samples.
- One of the six surface water samples exceeded the Ecological TDL for silver.
- The laboratory reporting limit for silver was higher than the Ecological TDL for five of the six surface water samples.

Sediment Samples (six samples)

- One sediment sample exceeded the Human Health TDL for arsenic.
- Two sediment samples exceeded one or more of the applicable Ecological TDLs for lead, one of the samples exceeded the Ecological TDL for nickel, and one of the samples exceeded the Ecological TDL for zinc.

3.3.3.3 AOI 5-4

The location, configuration, features and sample locations related to AOI 5-4 are shown on Figure 5. Three geologic cross-sections of the area are shown on Figures 13 through 15. Waste/Fill characterization results are shown on Tables 15 and 16. Sample analytical results are summarized in Tables 17 through 20.

Unit/Waste Characterization

- Surface Area: 4.03 Acres
- Observed Thickness of Waste/Fill: 0 to 21 feet
- Calculated Estimated Volume of Waste/Fill: 68,000 yd³ (using average thickness of 8 feet)
- Containment barrier: None

The waste/fill materials encountered at AOI 5-4 consisted of gray and some light brown clay with some silt with intermixed tile. Chemical characterization of the surface and subsurface waste/fill materials indicated that all 17 of the metal COPI were present in the materials at varying concentrations. Barium, lead and zinc were present at the highest concentrations with maximum values in subsurface samples of 1100, 1500 and 2500 mg/kg, respectively.

Surface Soil Samples (six samples)

- Five surface soil samples exceeded the Human Health TDL for arsenic.
- All six surface soil samples exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Subsurface Soil Samples (twelve samples)

- Ten subsurface soil samples exceeded the Human Health TDL for arsenic.
- All twelve subsurface soil samples exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Surface Water Samples (five samples)

- The laboratory reporting limit for mercury was higher than the Human Health TDL for all five surface water samples.
- The laboratory reporting limit for silver was higher than the Ecological TDL for all five surface water samples
- One of the samples exceeded the Ecological TDL for cobalt.

Sediment Samples (four samples)

- Three of the four sediment samples exceeded the Human Health TDL for arsenic.
- All four sediment samples exceeded the Ecological TDL for nickel, two of the samples exceeded the Ecological TDL for zinc, and one of the samples exceeded the Ecological TDL for lead.

3.3.3.4 AOI 5-5

The location, configuration, features and sample locations related to AOI 5-5 are shown on Figure 6. A geologic cross-section of the area is shown on Figure 16. Waste/Fill characterization results are shown on Tables 21 and 22. Sample analytical results are summarized in Tables 23 through 28.

Unit/Waste Characterization

- Surface Area: 1.7 Acres
- Observed Thickness of Waste/Fill: 4 to 21 feet
- Calculated Estimated Volume of Waste/Fill: 29,000 yd³ (using average thickness of 10.5 feet)
- Containment barrier: None

The waste/fill materials encountered at AOI 5-5 consisted of mine spoil containing abundant red and brown clay and intermixed tile. Chemical characterization of the surface and subsurface waste/fill materials indicated that all 17 of the metal COPI were present in the materials at varying concentrations. Barium, cobalt, lead and zinc were present at the highest concentrations with maximum values in subsurface samples of 2300, 170, 170 and 2400 mg/kg, respectively.

Surface Soil Release Samples (three samples)

- Two of the three surface samples exceeded the Human Health TDL for arsenic.
- All three surface samples exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Subsurface Soil Samples

- All six subsurface samples exceeded the Human Health TDL for arsenic.
- All six subsurface samples exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Surface Water Release Samples (two samples)

- Both surface water samples exceeded the Human Health TDL for mercury, and one of the two exceeded the Human Health TDL for lead.
- Both surface water samples exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Sediment Samples (two samples)

- Both sediment samples exceeded the Human Health TDL for arsenic.
- Both sediment samples exceeded the Ecological TDL for arsenic and lead.

Seeps & Soil Associated with Seeps (one sample location)

- Seep water sample 5-5-SEEP-1 exceeded the Human Health TDL for mercury.
- The laboratory reporting limit for 1,2-dibromoethane in seep water sample 5-5-SEEP-1 was higher than the Human Health TDL.
- Seep water sample 5-5-SEEP-1 exceeded the Ecological TDLs for lead.
- The laboratory reporting limit for silver in seep water sample 5-5-SEEP-1 was higher than the Ecological TDL.
- The soil sample associated with the one seep exceeded the Human Health TDL for arsenic.
- The soil sample associated with the one seep exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

3.3.3.5 AOI 5-6

The location, configuration, features and sample locations related to AOI 5-6 are shown on Figure 7. A geologic cross-section of the area is shown on Figure 17. Waste/Fill

characterization results are shown on Tables 29 and 30. Sample analytical results are summarized in Tables 31 through 34.

Unit/Waste Characterization

- Surface Area: 2.14 Acres
- Observed Thickness of Waste/Fill: 2.5 to 50 feet
- Calculated Estimated Volume of Waste/Fill: 86,000 yd³ (using average thickness of 25 feet)
- Containment barrier: None

The waste/fill materials encountered at AOI 5-6 consisted of red, gray and white clay and some silt with intermixed tile and solid waste (paper, cardboard and steel). Chemical characterization of the surface and subsurface waste/fill materials indicated that all 17 of the metal COPI were present in the materials at varying concentrations. Barium, cobalt lead, nickel and zinc were present at the highest concentrations with maximum values in subsurface samples of 110, 590, 120, 150 and 1100 mg/kg, respectively.

Surface Soil Samples (four samples)

- All four surface soil samples exceeded the Human Health TDL for arsenic.
- All four surface soil samples exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Subsurface Soil Samples (seven samples)

- All seven subsurface soil samples exceeded the Human Health TDL for arsenic.
- All seven subsurface soil samples exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Surface Water Samples (two samples)

- The laboratory reporting limit for mercury was higher than the Human Health TDL for both surface water samples.
- The laboratory reporting limit for silver was higher than the Ecological TDL for both surface water samples.

Sediment Samples

- None of the sediment samples exceeded the Human Health TDLs for the COPI.
- Both sediment samples exceeded the Ecological TDL for nickel.

3.3.3.6 AOI 5-7

The location, configuration, features and sample locations related to AOI 5-7 are shown on Figure 8. Two geologic cross-sections of the area are shown on Figures 18 and 19. Waste/Fill characterization results are shown on Tables 35 and 36. Sample analytical results are summarized in Tables 37 through 42.

Unit/Waste Characterization

- Surface Area: 2.05 Acres
- Observed Thickness of Waste/Fill: 4.5 to 20+ feet
- Calculated Estimated Volume of Waste/Fill: 33,000 yd³ (using average thickness of 10 feet)
- Containment barrier: None

The waste/fill materials encountered at AOI 5-7 consisted of gray clay with silt and intermixed tile. Chemical characterization of the surface and subsurface waste/fill materials indicated that all 17 of the metal COPI were present in the materials at varying concentrations. Barium, lead and zinc were present at the highest concentrations with maximum values in subsurface samples of 1400, 510 and 1900 mg/kg, respectively.

Surface Soil Samples (three samples)

- All three surface soil samples exceeded the Human Health TDL for arsenic.
- All three surface soil samples exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Subsurface Soil Samples (eight samples)

- Seven of the eight subsurface soil samples exceeded the Human Health TDL for arsenic.
- All eight subsurface soil samples exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.
- Two of the eight subsurface soil samples exceed the Soil Screening Level for migration to groundwater for arsenic.

Surface Water Samples (four samples)

- The laboratory reporting limit for mercury was higher than the Human Health TDL for all four surface water samples.
- All four surface water samples exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.
- The laboratory reporting limit for silver was higher than the Ecological TDL for all four surface water samples.

Sediment Samples (four samples)

- Two of the four sediment samples exceeded the Human Health TDL for arsenic.
- Three of the four sediment samples exceeded the Ecological TDL for zinc, two of the four exceeded the Ecological TDL for lead, and one of the four exceeded the Ecological TDL for arsenic.

Seeps & Soil Associated with Seeps (three samples)

- In the water samples, the laboratory reporting limits for both mercury and 1,2-dibromoethane were higher than the Human Health TDLs for all three samples.
- All three water samples associated with the seeps exceed one or more of the applicable Ecological TDLs for several inorganic COPI.
- In the water samples, the laboratory reporting limit for silver was higher than the Ecological TDL for all three samples.
- All three soil samples associated with the seeps exceeded the Human Health TDL for arsenic.
- All three soil samples associated with the seeps exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.

3.3.3.7 AOI 5-9

The location, configuration, features and sample locations related to AOI 5-9 are shown on Figure 9. A geologic cross-section of the area is shown on Figure 20. Waste/Fill characterization results are shown on Tables 43 and 44. Sample analytical results are summarized in Tables 45 through 48.

Unit/Waste Characterization

- Surface Area: 0.59 Acres
- Observed Thickness of Waste/Fill: 0 to 16.5+ feet
- Calculated Estimated Volume of Waste/Fill: 13,000 yd³ (using average thickness of 8.25 feet)
- Containment barrier: None

The waste/fill materials encountered at AOI 5-9 consisted of brown silt and clay with intermixed tile. Chemical characterization of the surface and subsurface waste/fill materials indicated that all 17 of the metal COPI were present in the materials at varying concentrations. Barium and zinc were present at the highest concentrations with maximum values in samples at concentrations of 540 and 100 mg/kg, respectively.

Surface Soil Samples (two samples)

- Both surface soil samples exceed the Human Health TDL for arsenic.
- Both surface soil samples exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.

Subsurface Soil Samples (five samples)

- All five subsurface soil samples exceed the Human Health TDL for arsenic.
- All five subsurface soil samples exceed one or more of the applicable Ecological TDLs for numerous inorganic COPI.
- One of the five subsurface soil samples exceeded the applicable Soil Screening Levels for migration to groundwater for arsenic and nickel.

Surface Water Samples (three samples)

- The laboratory reporting limit for mercury was higher than the Human Health TDL for all three surface water samples.
- The laboratory reporting limit for silver was higher than the Ecological TDL for all three surface water samples.
- One of the three surface water samples exceeded the Ecological TDL for cobalt.

Sediment Samples (three samples)

- None of the three sediment samples exceeded the Human Health TDLs for the COPI.
- All three sediment samples exceeded the applicable Ecological TDLs for lead, and zinc, and two of the samples exceeded the Ecological TDL for nickel.

3.3.3.8 AOI 5-10

The location, configuration, features and sample locations related to AOI 5-10 are shown on Figure 10. A geologic cross-section of the area is shown on Figure 21. Waste/Fill characterization results are shown on Table 49 and 50. Sample analytical results are summarized in Tables 51 through 55.

Unit/Waste Characterization

- Surface Area: 0.31 Acres
- Observed Thickness of Waste/Fill: 1.5 to 13 feet
- Calculated Estimated Volume of Waste/Fill: 3,000 yd³ (using average thickness of 6.5 feet)
- Containment barrier: None

The waste/fill materials encountered at AOI 5-10 consisted of gray silt and clay with intermixed tile and solid waste (tire and plastic sheeting). Chemical characterization of the surface and subsurface waste/fill materials indicated that all 17 of the metal COPI were present in the materials at varying concentrations. Barium, lead and zinc were present at the highest concentrations with maximum values in subsurface samples of 2600, 71 and 300 mg/kg, respectively.

Surface Soil Samples (no samples)

- No surface soil samples were collected from AOI 5-10.

Subsurface Soil Samples (three samples)

- Seven of the nine subsurface soil samples exceeded the Human Health TDL for arsenic

Surface Water Samples (three samples)

- Two of the three surface water samples exceeded the Human Health TDL for mercury and lead.
- The laboratory reporting limit for mercury was higher than the Human Health TDL for one of the three surface water samples.
- All three surface water samples exceeded one or more of the applicable Ecological TDLs for the inorganic COPI.

Sediment Samples (three samples)

- None of the three sediment samples exceeded any of the Human Health TDLs.
- All three sediment samples exceeded the Ecological TDL for zinc, two of the three exceeded the Ecological TDL for lead, and one of the three exceeded the Ecological TDL for nickel.

Seeps & Soil Associated with Seeps (two samples)

- The laboratory reporting limits for both mercury and 1,2-dibromoethane in seep water sample 5-10-SEEP-1 was higher than the Human Health TDLs.
- The laboratory reporting limit for silver in seep water sample 5-10-SEEP-1 was higher than the Ecological TDL.
- The water sample associated with 5-10-SEEP-1 exceeded Ecological TDLs for cobalt and zinc.
- The soil sample associated with the one seep exceeded the Human Health TDL for arsenic.
- The soil sample associated with the one seep exceeded one or more of the applicable Ecological TDLs for numerous inorganic COPI. The carbon disulfide concentration in the first sample collected at this location exceeded the Ecological TDL. A confirmatory sample was collected at this location for analysis of carbon disulfide; the result from re-sampling did not exceed the Ecological TDL.

3.3.3.9 AREA NORTHWEST OF AOI 5-10

On June 27, 2006 the U.S. EPA conducted a visit at the Facility to inspect each of the AOI areas. As a result of the inspection, the U.S. EPA requested that a surface water sample (ADD-SW-1) and a sediment sample (ADD-SED-1) be collected from an area located to the northwest of AOI 5-10 (see Figure 10). Sample analytical results are summarized in Tables 56 and 57.

Surface Water Sample

- The laboratory reporting limit for mercury was higher than the Human Health TDL for the surface water sample.
- The laboratory reporting limit for silver was higher than the Ecological TDL for the surface water sample.

Sediment Sample

- The one sediment sample exceeded the Human Health TDL for arsenic.
- The one sediment sample exceeded the applicable Ecological TDL for lead, nickel and zinc.

3.3.3.10 AOI 6: WASTE WATER TREATMENT PLANT (WWTP) EVALUATION

In accordance with the Work Plan, a Professional Engineer performed an inspection of the Laufen plant on-site WWTP. The inspection was conducted on August 1, 2006 to evaluate the integrity of the system and associated components relative to the potential for releases from the system to the environment. A copy of the Engineer's report is included in Appendix G. Based on the results of the inspection it was concluded that the WWTP was integral and that there were no observable indications that a mechanism for a release to the environment existed with regard to the WWTP components, equipment, and/or appurtenances.

3.4 GROUNDWATER CHARACTERIZATION

As described in the IHS Report and Section 3.1 of this report, there was no laterally-continuous groundwater-bearing unit identified in the unconsolidated deposits located at the Facility. However, discontinuous lenses of saturation were encountered at certain AOIs. At these locations, either temporary or permanent monitoring wells were installed to determine the absence or presence of a release to shallow groundwater contained within the unconsolidated deposits. A summary of the findings for each AOI is provided below.

3.4.1 AOI 5-1

Two previously installed groundwater monitoring wells (TW-2 and TW-3) located to the north of AOI 5-1 were utilized to collect groundwater samples for analysis of the COPI metals. The locations of these wells are shown on Figure 3. The laboratory analytical results for the collected groundwater samples indicated that none of the groundwater results exceeded any of their applicable Human Health TDLs. The summarized results are provided in Table 60. As such,

there is no indication that a release of the COPI metals to the shallow groundwater in the vicinity of AOI 5-1 has occurred.

3.4.2 AOI 5-3

Monitoring well PZ-2 was installed on the eastern side of AOI 5-3, at a location interpreted to be hydraulically downgradient of the unit (see Figure 4). Groundwater samples were collected for analysis of the COPI metals. The laboratory analytical results for the collected groundwater sample indicated that none of the groundwater results exceeded any of their applicable human health TDLs. The summarized results are provided in Table 60. As such, there is no indication that a release of the COPI metals to the shallow groundwater in the vicinity of AOI 5-3 has occurred.

3.4.3 AOI 5-4

Monitoring well PZ-3 was installed to the east of AOI 5-4, at a location interpreted to be hydraulically downgradient of the unit (see Figure 5). Groundwater was not encountered in the unconsolidated deposits at any of the other proposed monitoring locations or soil boring locations. Groundwater samples were collected from PZ-3 for analysis of the COPI metals. The laboratory analytical results for the collected groundwater sample indicated that none of the groundwater results exceeded any of their applicable Human Health TDLs. The summarized results are provided in Table 60. As such, there is no indication that a release of the COPI metals to the shallow groundwater in the vicinity of AOI 5-4 has occurred.

3.4.4 AOI 5-5

Temporary Well 5-5-Temp Well was installed in the north-central portion of AOI 5-5 (see Figure 6). Groundwater samples were collected for analysis of VOCs and the COPI metals (total and dissolved). The analytical results are summarized in Tables 58 and 59. With regard to VOCs, the following summarizes the results:

- 1,2-Dibromo-3-chloropropane and 1,2-Dibromoethane: not detected, but laboratory detection limit exceeded the human health TDL.

- Chloroform and methylene chloride: detected at or below laboratory reporting limit, but values were flagged as "estimated" values. Both are common laboratory contaminants. The estimated values were well below the human health TDLs.
- Carbon disulfide: detected below laboratory reporting limit, but value flagged as an estimated value. The estimated value was well below the human health TDL.

Of the COPI metals reported, total (unfiltered) lead was identified at a concentration of 0.028 milligrams per liter (mg/L), which exceeds the human health TDL. The dissolved (filtered) lead result indicated a concentration of 0.011 mg/L, which is below the human health TDL. No other COPI metals were identified at concentrations exceeding the human health TDLs in total (unfiltered) or dissolved (filtered) samples.

3.4.5 AOI 5-6

No groundwater was encountered in the unconsolidated deposits at the proposed monitoring locations or within the soil borings drilled within the unit.

3.4.6 AOI 5-7

Temporary Well 5-7-Temp Well was installed in the southern portion of AOI 5-7, and monitoring well PZ-1 was installed immediately south of the unit (see Figure 8). Groundwater was not encountered during drilling at any other proposed monitoring locations or within the soil borings. Groundwater samples were collected from 5-7-Temp Well for analysis of VOCs and the COPI metals (total and dissolved). Groundwater samples were collected from PZ-1 for analysis of the COPI metals. None of the COPI metals were present in the groundwater sample collected from PZ-1 at concentrations exceeding the human health TDL.

The analytical results for the groundwater samples collected from 5-7-Temp Well indicated the following with regard to VOCs:

- 1,2-Dibromo-3-chloropropane and 1,2-Dibromoethane: not detected, but laboratory detection limit exceeded the human health TDL.

- Chloroform and methylene chloride: detected at or below laboratory reporting limit, but values were flagged as "estimated" values. Both are common laboratory contaminants. The estimated values were well below the human health TDLs.

Of the COPI metals reported, total (unfiltered) lead was identified at a concentration of 0.016 mg/L, which exceeds the human health TDL. The dissolved (filtered) lead result indicated a concentration of 0.0033 mg/L, which is below the human health TDL. The total and dissolved barium sample results (3.1 and 3.2 mg/L, respectively) exceeded the human health TDL. No other COPI metals were identified at concentrations exceeding the human health TDLs in total (unfiltered) or dissolved (filtered) samples.

3.4.7 AOI 5-9

Temporary Well 5-9-Temp Well was installed in the north-central portion of the unit (see Figure 9). Groundwater was not identified in the unconsolidated deposits at any of the other proposed monitoring locations. The laboratory results for the groundwater samples collected from 5-9-Temp Well indicated the following with regard to VOCs:

- 1,2-Dibromo-3-chloropropane and 1,2-Dibromoethane: not detected, but laboratory detection limit exceeded the human health TDL.
- Benzene and 1,4-Dichlorobenzene and Dichlorodifluoromethane: detected, but values were flagged as "estimated" values. The estimated values were well below the human health TDLs.
- Chloroform and methylene chloride: detected at or below laboratory reporting limit, but values were flagged as "estimated" values. Both are common laboratory contaminants. The estimated values were well below the human health TDLs.

None of the COPI metals were identified at concentrations exceeding the human health TDLs in total (unfiltered) or dissolved (filtered) samples.

3.4.8 AOI 5-10

Monitoring well PZ-4 was installed to the east of AOI 5-10, at a location interpreted to be hydraulically downgradient of the unit (see Figure 10). Groundwater was not encountered in the unconsolidated deposits at any of the other proposed monitoring locations or soil boring locations. Groundwater samples were collected from PZ-4 for analysis of the COPI metals. The laboratory analytical results for the collected groundwater sample indicated that none of the groundwater results exceeded any of their applicable Human Health TDLs. The summarized results are provided in Table 60. As such, there is no indication that a release of the COPI metals to the shallow groundwater in the vicinity of AOI 5-10 has occurred.

4.0 QA/QC SUMMARY

This section provides a summary of the QA/QC procedures completed during the on-Site RCRA Facility Investigation sampling activities, and discusses the usability of the collected data with regard to any identified QA/QC excursions or qualifications.

4.1 SAMPLING PROCEDURES

Samples of soil, sediment, groundwater and surface water were collected in conformance with QA/QC procedures specified in the RFI QAPP. A detailed summary of sample collection procedures is provided in Section 2.0 of this report. The following subsections provide a summary of QA/QC procedures associated with sampling procedures.

4.1.1 *Sample Containers*

TriMatrix provided sample containers for each sampling task. These containers were cleaned by the manufacturer to meet or exceed the analyte specifications established in the U.S. EPA, "Specifications and Guidance for Obtaining Contaminant-Free Sample Containers", April 1992, OSWER Directive #9240.0-0.5A. The specific sample containers, preservation methods, maximum holding times, and sample packaging information for each target parameter and sampling task were consistent with U.S. EPA protocols the RFI QAPP.

4.1.2 *Sample Labeling*

Each sample was labeled with a unique sample identification, facilitating tracking and cross-referencing of sample information. A description of sample nomenclature and examples of sample identification nomenclature is provided in the glossary of acronyms, terms and sample nomenclature included in the front of this report. The sample ID, sample type, sampler's name, date and time of sample collection, preservation technique (if any) and analysis requested were entered on sample custody records (e.g. field logbooks, sample labels, and chain-of-custody (COC) forms).

4.1.3 *Field QC Sample Collection*

Twelve equipment rinsate blank samples were collected (refer to Section 2.10) to assess accuracy which is subject to variability associated with the sampling process (e.g. field contamination, equipment decontamination). These samples represent approximately 13 percent of the total number of investigative samples collected when non-dedicated sampling equipment was used (12 rinse blanks and 90 investigative samples).

Twenty-nine field duplicate samples were collected (refer to Section 2.10) to assess precision which is subject to variability associated with sampling technique, instrument performance, and matrix heterogeneity. For each matrix sampled, the number of duplicates exceeded 10 percent of the total number of investigative samples as summarized in the following table.

Matrix	Number of Field Duplicate Samples Collected	Total Number of Investigative Samples Collected	Percentage of Samples that were Field Duplicate Samples
Soil	20	193	10.36
Sediment	3	24	12.5
Groundwater	2	9	22.2
Surface Water	4	29	13.79
Total	29	255	11.37

4.1.4 Field Decontamination

All non-dedicated sampling equipment was decontaminated before and after collection of each sample in accordance with procedures specified in the RFI QAPP.

4.1.5 Equipment Calibration and Maintenance

Field instruments used during the investigation included photoionization detectors (PIDs), thermometers, pH meters, specific conductivity (SC) meters, dissolved oxygen (DO) meters, and nephelometers. These instruments were calibrated and maintained in accordance with procedures specified in the RFI QAPP. Documentation of calibration and or maintenance was recorded in field log books and/or field sampling forms.

4.1.6 Field Corrective Action

In accordance with the RFI QAPP, the following field corrective actions were implemented during completion of RFI Phase I field activities.

4.1.6.1 Adjustment of Sample Location and/or Quantities

The location and quantities of samples collected during RFI Phase I field activities were adjusted based on conditions encountered during the investigation. Discussion of adjustments is summarized in Section 2.0 of this report and in Table 2. These adjustments did not adversely affect the objectives of the investigation.

4.1.6.2 Confirmatory Samples

Concentrations of carbon disulfide were detected in surface water and soil samples collected from seeps adjacent to AOI 5-5, AOI 5-7, and AOI 5-10 on June 27, 2006. The concentrations of carbon disulfide detected in surface water and soil sample 5-10-SEEP-1 were elevated in comparison to concentrations detected in samples collected from the other two seeps. Specifically, the concentration of carbon disulfide detected in soil sample 5-10-SEEP-1 (0.31 mg/kg) exceeded the ecological TDL. Therefore one surface water sample and one soil sample were collected from sample location 5-10-SEEP-1 on August 9, 2006 to evaluate if the results of the June 27, 2006 sample were accurate. Carbon disulfide was detected in each of the samples collected on August 9, 2006; however, detected concentrations were below the human health and ecological TDL's.

It is believed that the carbon disulfide detected in these soil and surface water samples is naturally occurring as the result of anaerobic decomposition of organic material and/or water flowing through high-sulfur mine spoil material.

4.2 CUSTODY PROCEDURES

Documentation of sample collection and transfer was conducted in accordance with the RFI QAPP as summarized in the following subsections.

4.2.1 Field Custody Procedures

Field custody was maintained through the use of field logbooks, sample labels, sample tags, and chain-of-custody (COC) records. Information recorded in field logbooks by field personnel included equipment used to collect samples, sample date and time, sample description, sample depth, and the volume and number of containers. Sample labels and sample tags were affixed to all sample containers submitted for analysis.

All samples were accompanied by properly completed a chain of custody (COC) forms to document the transfer of custody of samples from the sampler to the analytical laboratory. Information recorded on the COC by field personnel included sample identification, sample date and time, the number of containers, and requested analytical parameters.

4.2.2 Transfer Of Custody And Shipment Procedures

Samples were packaged in laboratory supplied coolers for shipment to the TriMatrix for analysis. A separate signed COC record was enclosed within each cooler. Prior to shipping, each cooler was secured with strapping tape. Samples were transferred via a subcontracted overnight courier service.

4.2.3 Laboratory Chain-Of-Custody Procedures

Laboratory custody procedures document sample receipt, integrity of the coolers, sample condition (i.e., unbroken, cooled, etc.), completeness of associated paperwork (e.g., COC records), sample volume, and sample preservation. Upon receipt, TriMatrix assigned a unique laboratory sample identification to each incoming sample. Samples received by the laboratory were stored in secure, limited access areas (refrigerated storage, if required). Handling of the samples during sample analysis and subsequent storage was conducted in accordance with TriMatrix internal custody procedures as specified in the RFI QAPP.

4.2.4 Laboratory Corrective Action

TriMatrix sample receipt documentation noted several minor discrepancies as summarized below. All discrepancies were resolved via communication between the laboratory Project Manager and CEC field personnel prior to sample analysis and/or documented in the analytical data package.

Discrepancy	Resolution
On June 3, 2006, TriMatrix received one soil sample labeled 5-6-CS-4 which was not listed on the COC form.	Based on communication with CEC field personnel, TriMatrix completed a COC for the sample and analyzed the sample for the same parameters as other samples in that shipment.
On June 3, 2006, TriMatrix received three soil samples with discrepancies between sample ID listed on the sample tags and the sample ID listed on the COC form.	Based on communication with CEC field personnel, TriMatrix named the samples based on the sample ID's listed on the sample tags, and analyzed the samples for the same parameters as other samples in that shipment.
On June 8, 2006, TriMatrix received one soil sample labeled 5-6-CS-4 in a broken container.	Contents of the sample were contained within the broken container; therefore, TriMatrix transferred sample contents into a new sample jar and proceeded with the requested analysis.
On June 8, 2006, TriMatrix received one surface water sample labeled 5-10-SW-1 with a pH greater than 2.	TriMatrix preserved the sample upon receipt and proceeded with the requested analysis.
On June 8, 2006, TriMatrix received one duplicate surface water sample labeled 5-7-SW-DUP with no sample time indicated.	TriMatrix assigned a sample collection time of 00:00. As a result the sample exceeded the hold time for hexavalent chromium analysis, and results for that analysis were considered estimated.
On June 21, 2006, TriMatrix received one soil sample labeled 5-4-TP-4-1 in a broken container.	Contents of the sample were contained within the broken container; therefore, TriMatrix transferred sample contents into a new sample jar and proceeded with the requested analysis.
On June 28, 2006, TriMatrix received one duplicate surface water sample labeled 5-7-SEEP-DUP with no sample time indicated.	TriMatrix assigned a sample collection time of 00:00. As a result the sample exceeded the hold time for hexavalent chromium analysis, and results for that analysis were qualified estimated.
Most cooler temperatures and average sample temperatures exceeded 6°C.	No action was required for inorganic parameters. Results for organic parameters were qualified estimated.
Sample coolers were received without custody seals.	The coolers were secured with strapping tape and did not appear to have been tampered with during transport to the laboratory; therefore, no action was taken by TriMatrix.

4.3 DATA VALIDATION

Validata Chemical Services, Inc. (Validata) conducted independent third-party validation of laboratory data generated during the RFI Phase I Investigation in conformance with the following guidance documents:

- *U.S. EPA Contract Laboratory Program, National Functional Guidelines for Organic Data Review*, 1999; and,
- *U.S. EPA Contract Laboratory Program, National Functional Guidelines for Inorganic Data Review*, 2004.

When qualification of the sample data was required, the sample results associated with a QA/QC parameter deviation were qualified in accordance with the procedures outlined in the above-referenced guidance documents.

Validata completed EPA Level III review of approximately 60 percent of the data and EPA Level IV review for 40 percent of the data, as summarized in the table below. Level III review generally includes evaluation of the following to identify data quality issues that result from QC exceedances:

- technical holding times;
- instrument performance check sample results;
- results of initial and continuing calibration verification;
- results of all lab blanks and equipment rinse blanks;
- results of field duplicate pairs; and,
- surrogate spike recoveries, MS/MSD recoveries, and laboratory control samples recoveries.

Level IV review is a more detailed data assessment incorporating review of original raw data and rederivation of QC results from the raw data, in addition to all evaluations conducted as part of Level III review.

Parameter	Level III Review			Level IV Review		
	Samples	Duplicates	Blanks	Samples	Duplicates	Blanks
Total Metals	161	18	6	98	10	6
Hexavalent Chromium	151	18	6	98	10	4
VOCs	2	0	0	11	3	0

4.3.1 Major Data Issues

Two major data quality issues were identified during the data validation review resulting in qualification of approximately 0.55 percent of the data as rejected (R) and unusable. The percent recovery of hexavalent chromium in matrix spike 1 of soil sample 5-7-CS-8 was significantly below QC limits; therefore, non-detect results in samples associated with that matrix spike (17 of 20 results) were qualified R. The percent recovery for nickel in the CRDL standard analyzed with water samples on June 19, 2006 was significantly higher than QC limits; therefore, positive results for nickel in 13 of 15 aqueous samples in that sample delivery group were qualified R.

4.3.2 Minor Issues

4.3.2.1 Summary of Minor QC Deviations

The validation review resulted in the qualification of approximately 49 percent of the data due to minor QC deficiencies (e.g. percent recoveries for MS/MSD samples outside of QC limits). Justification for data qualification based on minor QC deficiencies and a description of data qualifier labels are summarized in data validation summary reports included in Appendix C. The data qualifiers are also indicated in attached data tables.

4.3.2.2 Laboratory Artifacts

Very low concentrations of some volatile organic compounds (VOCs) initially were detected in water and/or soil samples collected from the seeps and in water collected from temporary wells as summarized in the following table.

Parameter	Sample Media	Number of Samples with Detected Concentrations	Range of Concentration
1,4-Dichlorobenzene	Groundwater	2	0.0057 to 0.006 mg/L
Acetone	Soil	6	0.029 - 0.60 mg/kg
	Surface Water	1	0.0012 mg/L
Benzene	Groundwater	2	0.0001 - 0.00008 mg/L
2-Butanone (MEK)	Soil	5	0.0068 - 0.054 mg/kg
Carbon Disulfide	Surface Water	5	0.005 mg/L
	Soil	5	0.0046 - 0.31 mg/kg
Chlorobenzene	Groundwater	2	0.0041 - 0.0042 mg/L
Chloroform	Surface Water	2	0.0005 - 0.00017 mg/L
	Groundwater	3	0.00017 - 0.00018 mg/L
cis-1,2-Dichloroethene	Soil	1	0.0032 mg/kg
Dichlorodifluoromethane	Groundwater	2	0.0013 - 0.0014 mg/L
Isopropylbenzene (Cumene)	Soil	2	0.00082 - 0.00093 mg/kg
Methylene Chloride	Surface Water	4	0.001 mg/L
	Groundwater	3	0.001 mg/L
Toluene	Soil	1	0.0009 mg/kg
Trichloroethene	Soil	2	0.0014 - 0.083 mg/kg

Further detail of VOC analytical results can be found on Tables 27, 28, 41, 42, 54, 55, and 58.

As part of the data validation process, it was determined that two of the VOCs (carbon disulfide and methylene chloride) detected in the water samples also were detected in the corresponding laboratory method blanks. Therefore, positive results for carbon disulfide and methylene chloride less than five times (5X) and ten times (10X) the blank amount, respectively, were flagged as "undetected" or "not detected".

As discussed in Section 4.1.6.2, it is believed that carbon disulfide detected in the soil and surface water samples is naturally occurring as the result of anaerobic decomposition of organic material and/or water flowing through high-sulfur mine spoil material.

The VOCs acetone and 2-butanone (MEK) are considered to be common laboratory contaminants. Other VOCs which less frequently can be introduced into a sample at the laboratory include carbon disulfide, toluene, methylene chloride and chloroform (which can form by the degradation of chlorinated water). Although none of these five VOCs were detected in the corresponding laboratory method blanks, it is possible that the VOCs were introduced into the samples at the laboratory. Therefore, the detection of very low concentrations of these five

VOCs in the soil and/or water samples is considered suspect, and may not be representative of actual Facility conditions.

Detected concentrations of VOCs did not exceed the respective ecological or human health TDL's, with the exception of carbon disulfide detected in soil sample 5-10-SEEP-1 (0.31 mg/kg) collected on June 27, 2006 which exceeded the ecological TDL (0.0941 mg/kg). The carbon disulfide concentration detected in a confirmatory soil sample collected on August 9, 2006 from sample location 5-10-SEEP-1 (0.0046 mg/kg) was below the human health and ecological TDL's. Therefore, the presence of the very low concentrations of these VOCs in soil and/or water should not warrant further investigation.

4.4 OVERALL DATA USABILITY

Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process. The percent usability calculation includes quality control samples collected to aid in the evaluation of data usability (e.g., field duplicates and equipment rinse blanks). Data completeness with respect to usability was calculated separately for inorganic and organic analysis.

Parameter	Samples Analyzed ¹	Analytes per Sample	Total	Number of Results Rejected	Number of Results Estimated Due to QC Deficiencies	Percent Useable
Total Metals	299	17	5083	30	2234	99.5
VOCs	16	48	768	0	768	100

¹Includes investigative samples, field duplicate samples, and equipment rinse blank samples

As specified in the RFI QAPP, the overall precision, accuracy, representativeness, comparability, and completeness (PARCC) of the data were used as indicators of overall data quality. These parameters were assessed through an evaluation of the results of the field and laboratory QA/QC sample analyses to confirm that data collected for this investigation are in line with the Data Quality Objectives (DQOs) specified for the Site in the RFI QAPP.

4.4.1 Precision

Precision is a measure of the degree to which two or more measurements are in agreement. For this investigation, precision was defined as the relative percent difference (RPD) between duplicate sample results. The duplicate samples used to evaluate precision included laboratory duplicates, field duplicates, MS/MSD samples, and inductively coupled plasma (ICP) serial dilution samples.

For this analytical program, 44 percent of the data required qualification due to laboratory duplicate RPD, MS/MSD RPD or ICP serial dilution deviations. Based on the very low reporting and method detection limits required for this investigation, these precision issues are not uncommon and do not represent significant data quality issues that would call into question the usability of the data.

The majority of field duplicate RPD's were less than QC advisory limits as summarized in the table below. Validata indicated that data qualification was not required based on field duplicate criteria. The high RPD's observed for the selected field duplicate pairs are likely the result of sample heterogeneity, particularly for soil and sediment samples. The high RPD's do not represent significant data quality issues that would call into question the usability of the data.

Parameter	Samples Analyzed ¹	Analytes per Sample	Total	Number of Field Duplicate Results with RPD exceeding QC limits	Percent of Total with RPD exceeding QC advisory limits
Total Metals	29	17	493	68	13.8
VOCs	2	48	96	0	0.00

¹Includes investigative samples, field duplicate samples, and equipment rinse blank samples

4.4.2 Accuracy

Accuracy measures the bias in an analytical system or the degree of agreement of a measurement with a known reference value. For this investigation, accuracy was defined as the percent recovery of QA/QC samples that were spiked with a known concentration of an analyte or compound of interest. The QA/QC samples used to evaluate analytical accuracy included, instrument calibration, internal standards, Laboratory Control Standards (LCSs), MS/MSD samples, CRDL samples, and surrogate compound recoveries. Equipment rinse blanks were used

to evaluate field accuracy. For this analytical program, 44 percent of the data required qualification due to QC deviations for these analyses. These deviations do not represent significant data quality issues that would call into question the usability of the data.

4.4.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter that is dependent on proper design of the sampling program. This parameter has been addressed by conducting the investigation in conformance with the RFI Phase I Workplan and QAPP. Furthermore, USEPA-approved analytical methodologies were used.

Holding time is an indicator of the representativeness. For this analytical program, one percent of the data required qualification due to holding time deviations. These deviations occurred because a time of collection was not designated on sample labels or COC records for aqueous field duplicate samples. In accordance with standard operating procedures, the analytical laboratory assigned a time of 00:00 to the samples resulting in a holding time deviation for hexavalent chromium analysis. Since these field duplicate samples were collected at the same time as the associated duplicate pair, these samples were received and analyzed within the specified holding time. These holding time deviations do not represent significant data quality issues that would call into question the usability of the data.

As discussed in Section 4.3.2.2, very low concentrations of VOCs were detected in water and/or soil samples collected from the seeps. The detected VOCs consists of common laboratory contaminants and/or were detected in laboratory method blanks; therefore, the detection of very low concentrations of these VOCs is considered suspect, and may not be representative of actual Facility conditions.

4.4.4 Comparability

Comparability is a qualitative expression of the confidence with which one data set can be compared with another. To achieve this criterion, standardized techniques for sample collection, laboratory analysis, and reporting were implemented as specified in the RFI QAPP. Therefore, analytical data will be comparable with data from past and future sampling events, and with results from other laboratories using the same standardized techniques.

4.4.5 Completeness

Completeness is defined as the percentage of measurements that are judged to be valid or usable to meet the prescribed DQOs. The analytical data generated for the RFI Phase I investigation had an overall usability of 99 percent.

5.0 PRELIMINARY EVALUATION OF RELEASES AND PATHWAY EVALUATION SUMMARY

The RFI Phase I investigation was conducted in accordance with the U.S. EPA-approved Work Plan (June 2006) with few exceptions as noted throughout this report. The investigation included an Initial Hydrogeologic Study to gain a better understanding of the occurrence of shallow groundwater and the interaction of groundwater and surface water within the study area. The investigation also included an assessment of the AOI characteristics and their potential impact on the surrounding environmental medium. Samples were collected from materials within the visible areas of the AOIs and submitted to the analytical laboratory for chemical analysis of the COPI to determine the chemical characteristics of the waste and fill materials.

Environmental media samples consisting of soil, groundwater, surface water, sediments, seep water and seep soil were also collected and analyzed for the COPI. The objective of this process was to identify which COPI are present in the samples at concentrations that exceed the established screening levels and require further evaluation as part of the RFI, and to assure that reported concentrations are of acceptable quality for use in the quantitative risk assessment. This "Tier 1" screening conducted during the Phase I RFI included the following steps:

- Sort all analytical data by media type;
- Evaluate the quality of the data with respect to qualifiers and codes;
- Evaluate the quality of the data with respect to blanks; and
- Compare the maximum concentration levels with the established, generic risk-based screening levels provided in the approved RFI Work Plan.

A listing of the COPI segregated by which chemicals exceeded an established screening level in at least one of the media of concern for at least one sample point is provided in Table 61. An AOI-specific breakdown by media is provided in Table 62 to summarize the number of exceedences within each AOI. More specific details regarding the screening level exceedences and their associated AOIs, media and specific COPI are provided in Tables 63 through 65.

Based on the results of the Phase I RFI, a summary of the findings and conclusions for each media of concern is provided in the following sections.

5.1 UNIT/WASTE CHARACTERIZATION

The fill areas that comprise the investigated AOIs (with the exception of AOI 6) consist of mine spoil originating from previous mining and filling operations. Broken tile pieces are also present within the spoil, but the bulk of this material lies near the surface of the AOIs. During the subsurface invasive activities (soil borings and test pit installations), clay-like materials were also occasionally encountered in the fill/waste materials. Most of this material was gray in color and appeared to represent tile-body material; however some brightly colored materials were also found. No observed materials or field screening results indicated that unanticipated types of waste or fill were present within the investigated AOIs. As such, there are no additions proposed to the list of COPI for further evaluation as part of the RFI.

The chemical composition of the waste/fill materials within each of the respective AOIs that were subject to investigation as part of the Phase I RFI indicated that with the exception of hexavalent chromium, each of the metal COPI were detected within one or more of the AOIs at varying concentrations. This information, in conjunction with the analytical data for the samples collected from the environmental media (soil, surface water, sediment, seeps and groundwater) indicate that removal of hexavalent chromium as a COPI for further evaluation is appropriate.

5.2 SOIL SAMPLE RESULTS

The results of the soil sampling and analysis that was conducted at the AOIs indicates that the COPI are not present at concentrations that exceed the human health TDLs, with the exception of arsenic. Since arsenic is naturally-occurring in Ohio soils, particularly in northeastern Ohio, a background study will be conducted to establish a background concentration for arsenic to determine if the results of the Phase I RFI are indicative of a release to the environment or represent background conditions.

With regard to a comparison to ecological TDLs, many of the soil sample results indicated concentrations of COPI that exceed the established screening levels. As is the case with arsenic, it is possible that although many of the reported results exceed the highly conservative ecological TDLs, the results may be indicative of background conditions.

As such, a background study will be conducted to establish background concentrations for each of the 17 metal COPI. The details regarding the study design and implementation were contained in the January 4, 2007 Addendum I to the approved RFI Work Plan, which was

approved by the U.S. EPA on January 8, 2007. Once the background study is completed it is anticipated that the analytical data for each of the soil samples collected at the Facility for which one or more of the metal COPI were detected above either the established generic human health and/or ecological screening levels will be compared to background concentrations as a "secondary screening" tool in order to determine if further evaluation as part of RFI Phase II investigation activities will be necessary.

5.3 SURFACE WATER AND SEDIMENT SAMPLE RESULTS

At least one of the metal COPI exceeded the human health and/or ecological TDLs at each of the AOIs investigated during Phase I of the RFI. In the case of mercury and silver, several sample analysis results indicated that the laboratory detection limit exceeded the established screening level. The exceedences are summarized by AOI in the following table.

Area of Interest	Exceedence of Human Health or Ecological TDL*
AOI 5-1	Cadmium, Cobalt, Copper, Lead, Mercury, Silver and Zinc
AOI 5-3	Arsenic, Lead, Mercury, Nickel, Silver and Zinc
AOI 5-4	Arsenic, Cobalt and Zinc
AOI 5-5	Arsenic, Barium, Beryllium, Chrome (total), Cobalt, Copper, Lead, Mercury, Nickel, Selenium, Silver, Vanadium and Zinc
AOI 5-6	Mercury, Nickel and Silver
AOI 5-7	Beryllium, Cobalt, Lead, Nickel, Selenium and Zinc
AOI 5-9	Cobalt, Lead, Mercury, Nickel, Silver and Zinc
AOI 5-10	Barium, Beryllium, Cadmium, Chromium (total), Cobalt, Copper, Lead, Mercury, Nickel, Selenium, Silver, Vanadium and Zinc
ADD	Arsenic, Lead, Mercury, Silver and Zinc

*Includes results for mercury and silver where the detection limit exceeded the screening level

For each of the metal COPI where at least one exceedence was identified, these COPI will be further evaluated as part of Phase II of the RFI, which will include additional investigation and/or as part of a human health risk assessment and/or screening level ecological risk assessment. Hexavalent Chromium, Antimony and Thallium were not identified in any of the surface water or sediment samples at concentrations that exceed either the human health or ecological TDLs. As such, these chemicals are not considered to be a potential risk to human

health or the environment at the Facility and do not warrant further evaluation for surface water or sediment as part of the RFI.

5.4 SEEP SAMPLE RESULTS

At least one of the metal COPI exceeded the human health and/or ecological TDLs at each of the AOIs investigated during Phase I of the RFI. In the case of mercury and silver, several sample analysis results indicated that the laboratory detection limit exceeded the established screening level. The exceedences are summarized by AOI in the following table.

Water

Area of Interest	Exceedence of Human Health or Ecological TDL*
AOI 5-5	Lead, Mercury and Silver
AOI 5-7	Beryllium, Cobalt, Mercury, Nickel, Selenium, Silver and Zinc
AOI 5-10	Cobalt, Mercury, Silver and Zinc

*Includes results for mercury and silver where the detection limit exceeded the screening level

Soil

Area of Interest	Exceedence of Human Health or Ecological TDL
AOI 5-5	Antimony, Barium, Cadmium, Chromium (total), Cobalt, Copper, Lead, Nickel, Selenium, Thallium, Vanadium and Zinc
AOI 5-7	Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium (total), Cobalt, Copper, Lead, Nickel, Selenium, Vanadium and Zinc
AOI 5-10	Antimony, Arsenic, Barium, Cadmium, Chromium (total), Cobalt, Copper, Lead, Nickel, Selenium, Thallium, Vanadium and Zinc

For each of the metal COPI where at least one exceedence was identified, these COPI will be further evaluated as part of Phase II of the RFI, which will include additional investigation and/or as part of a human health risk assessment and/or screening level ecological risk assessment. Hexavalent Chromium was not identified in any of the seep water or seep soil samples at concentrations that exceed either the human health or ecological TDLs, and will not be carried forward for further evaluation for the seeps.

None of the VOCs exceeded any of the TDLs, except for 1,2-dibromoethane, 1,2-dibromo-3-chloropropane, and carbon disulfide. It should be noted though, that all of the indicated exceedences for 1,2-dibromoethane and 1,2-dibromo-3-chloropropane were the result of the laboratory detection limit being higher than the specific TDL rather than measured or actual exceedences. Carbon disulfide exceeded the ecological TDL in the first soil sample collected and analyzed from the seep at AOI 5-10; however, the confirmatory sample collected at this location did not confirm this exceedence. Based on the information gathered during Phase I of the RFI, there are no known potential sources of VOCs in the waste/fill materials within the investigated AOIs. As such, it is recommended that VOCs be eliminated from further evaluation during the RFI.

5.5 GROUNDWATER RESULTS

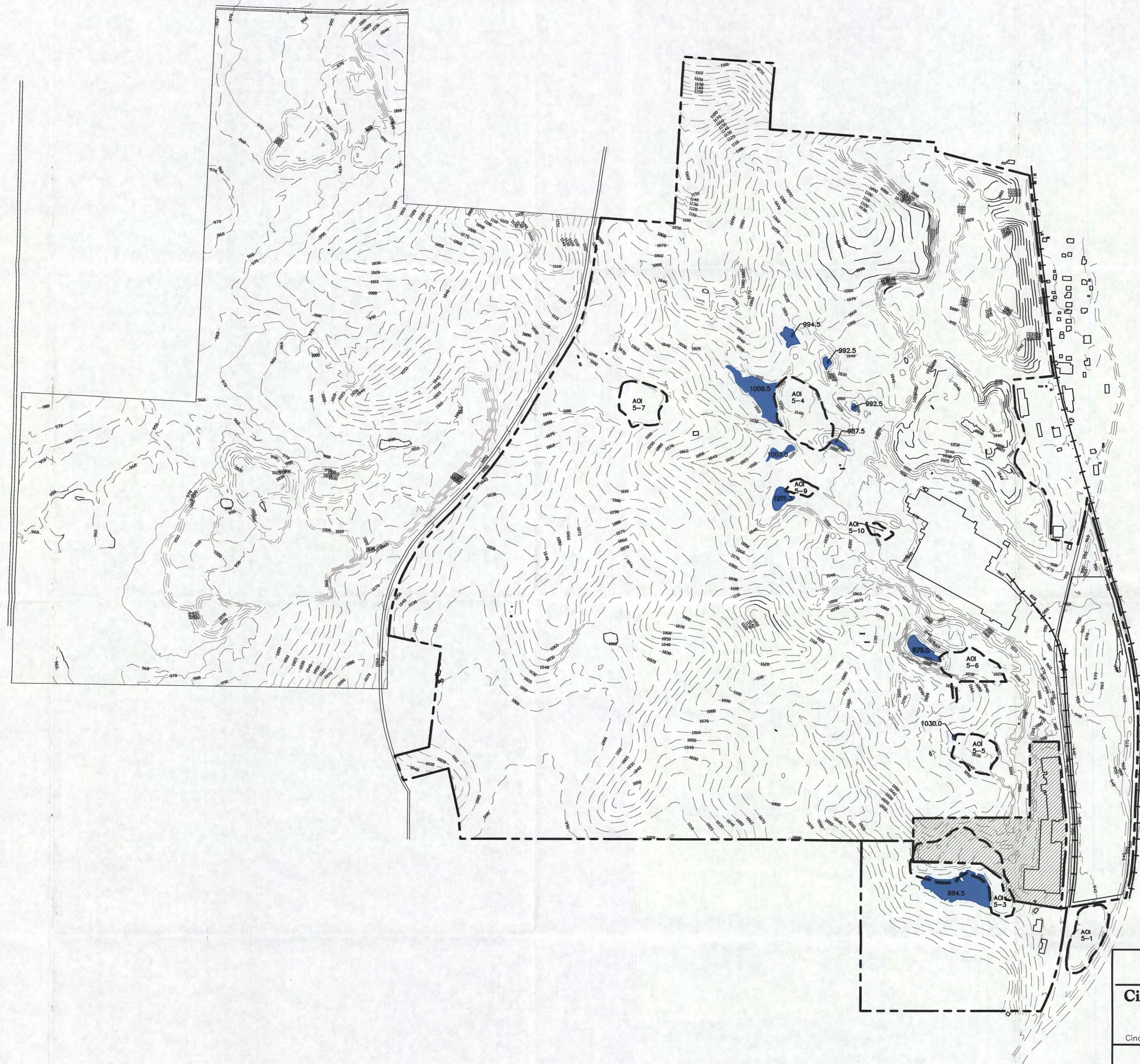
No exceedences of the human health TDLs were identified at AOI 5-1, AOI 5-3, AOI 5-4, AOI 5-9, or AOI 5-10. No groundwater was identified in the unconsolidated deposits for AOI 5-6. For AOI 5-5, total lead was the only COPI identified at a concentration exceeding the human health TDL. The dissolved (filtered) sample result was below the human health TDL.

For AOI 5-7, lead was identified at a concentration above the human health TDL for the total (unfiltered) sample; however, the dissolved (filtered) lead result indicated a concentration of 0.033 mg/L, which is below the human health TDL. The total and dissolved barium sample results (3.1 and 3.2 mg/L, respectively) exceeded the human health TDL. No other COPI metals were identified at concentrations exceeding the human health TDLs in total (unfiltered) or dissolved (filtered) samples. These samples were collected from a temporary well installed within the boundaries of the AOI. There is no indication that groundwater impacts are present in the unconsolidated deposits outside of the AOI boundaries, at locations where groundwater was identified (PZ-1).

5.6 CONCEPTUAL SITE MODEL

The Preliminary Conceptual Site Model provided in the approved RFI Work Plan was evaluated with regard to the information and data collected during Phase I of the RFI to determine if any modifications were appropriate. Although groundwater was not present within the unconsolidated deposits at several of the AOIs, it cannot be eliminated as an exposure pathway for consideration as part of a tiered risk assessment at this point in the investigation. Therefore,

the only substantive revision to the Conceptual Site Model justified by the results of the Phase I activities is the elimination of the on-site wastewater treatment plant as a potentially complete release mechanism. The revised Conceptual Site Model is provided as Figure 22.



LEGEND

- BOUNDARY OF AREA OF INTEREST (AOI)
- ___ RFI FACILITY BOUNDARY
- [Hatched Box] NOT AFFILIATED WITH U.S. CERAMIC TILE COMPANY



Civil & Environmental Consultants, Inc.

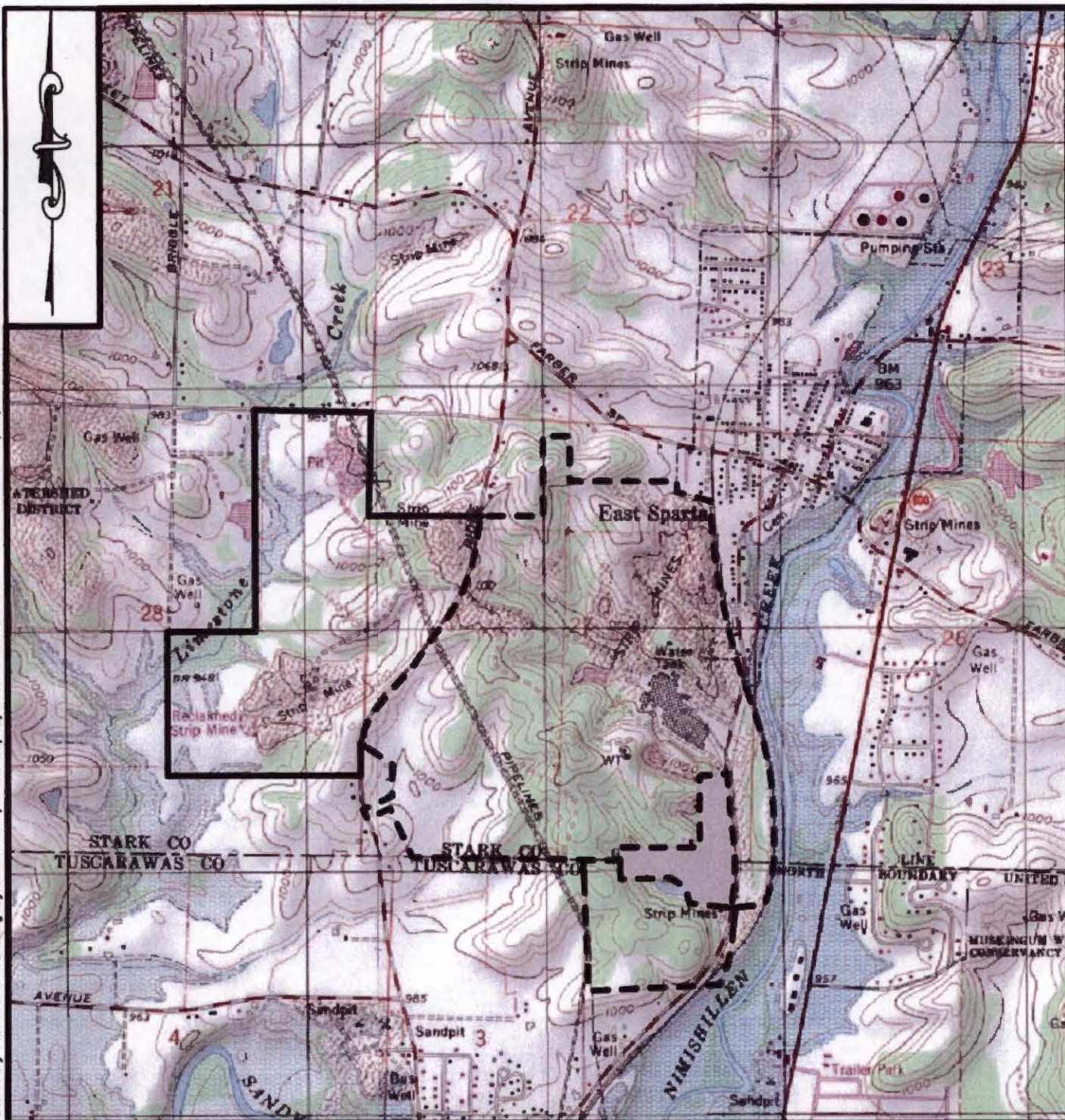
8740 Orion Place, Suite 100
Columbus, OH 43240
(614) 540-6633 • (888)598-6808
Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN

RCRA FACILITY INVESTIGATION LAUFEN INTERNATIONAL EAST SPARTA, OHIO

DATE: JAN 2007	APPROVED BY:	DWN BY: BTW
SCALE: 1" = 400'	RJW	CHKD. BY: RJW
AREAS OF INTEREST		SHEET OF
		FIGURE NUMBER
		2

FIGURES

G:\Projects\060770\DWG\EXHIBITS\Property Boundary FIG 1 WRK PLN.dwg by: bworkman printed 01/12/2007 08:34:04 am ~ last modified 01/12/2007 08:30:21 am--CEC, Inc.



- US CERAMIC TILE PROPERTY BOUNDARY
- US CERAMIC TILE RFI FACILITY BOUNDARY
- NOT AFFILIATED WITH U.S. CERAMIC TILE COMPANY



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**SITE LOCATION MAP
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO**

DWN BY: CSA

SCALE

DATE

PROJECT NO:

FIGURE NO:

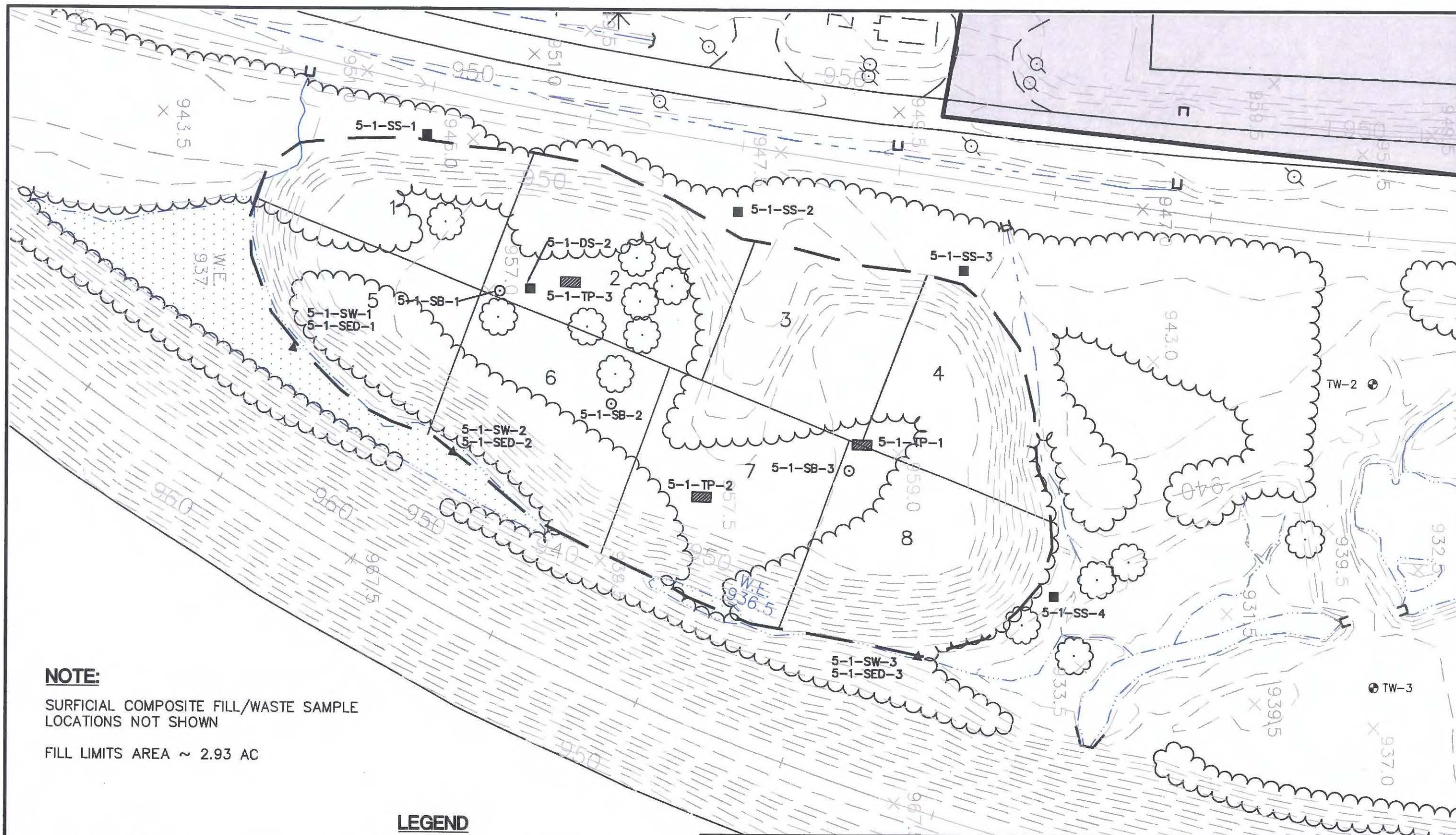
CHKD. BY: RJW

1"=2000'

JAN 2007

060-770

1



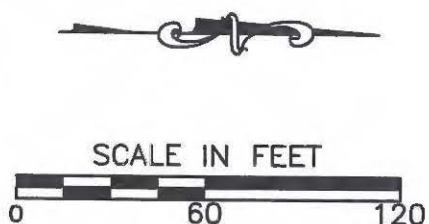
NOTE:

SURFICIAL COMPOSITE FILL/WASTE SAMPLE
LOCATIONS NOT SHOWN

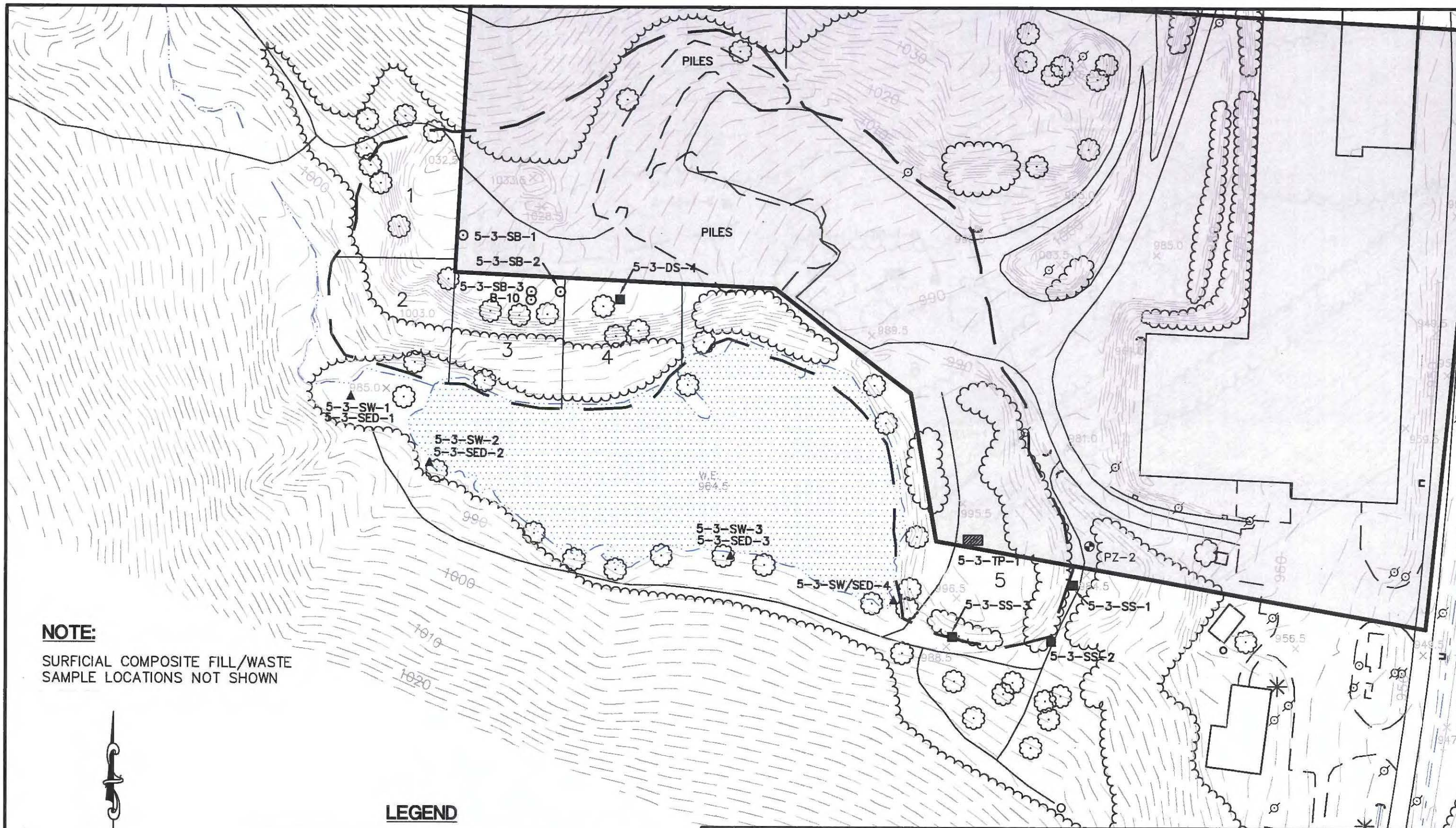
FILL LIMITS AREA ~ 2.93 AC

LEGEND

- APPROXIMATE FILL LIMITS
- ▲ SURFACE WATER/SEDIMENT
- SURFACE SOIL
- SOIL BORING
- ▨ TEST PIT
- ⊗ MONITORING WELL



Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-1 SAMPLING LOCATIONS PHASE I RFI LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: BTW CHKD. BY:	SCALE: 1"=60'	DATE: JAN 2007	PROJECT NO.: 060-770	FIGURE: 3



NOTE:

SURFICIAL COMPOSITE FILL/WASTE
SAMPLE LOCATIONS NOT SHOWN




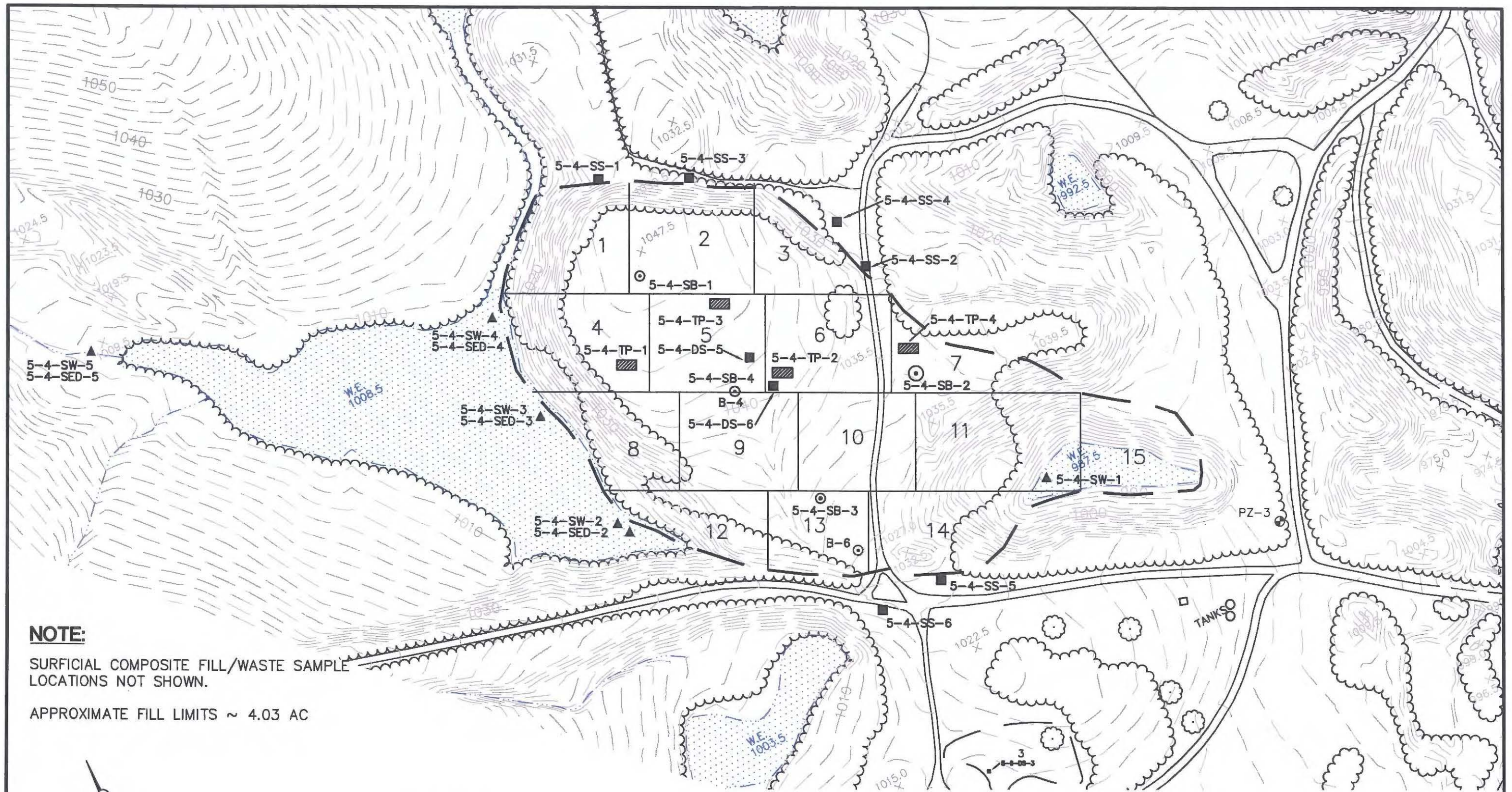
SCALE IN FEET



LEGEND

- S&N PROPERTY BOUNDARY
- APPROXIMATE FILL LIMITS
- ▲ SURFACE WATER/SEDIMENT
- SURFACE SOIL
- SOIL BORING
- ▨ TEST PIT
- ⊙ MONITORING WELL

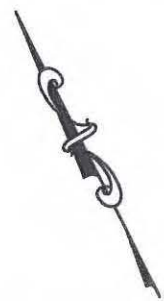
 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-3 SAMPLING LOCATIONS PHASE I RFI LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: BTW CHKD. BY:	SCALE: 1" = 100'	DATE: JAN 2007	PROJECT NO.: 060-770	FIGURE: 4



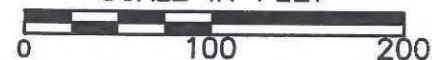
NOTE:

SURFICIAL COMPOSITE FILL/WASTE SAMPLE LOCATIONS NOT SHOWN.

APPROXIMATE FILL LIMITS ~ 4.03 AC




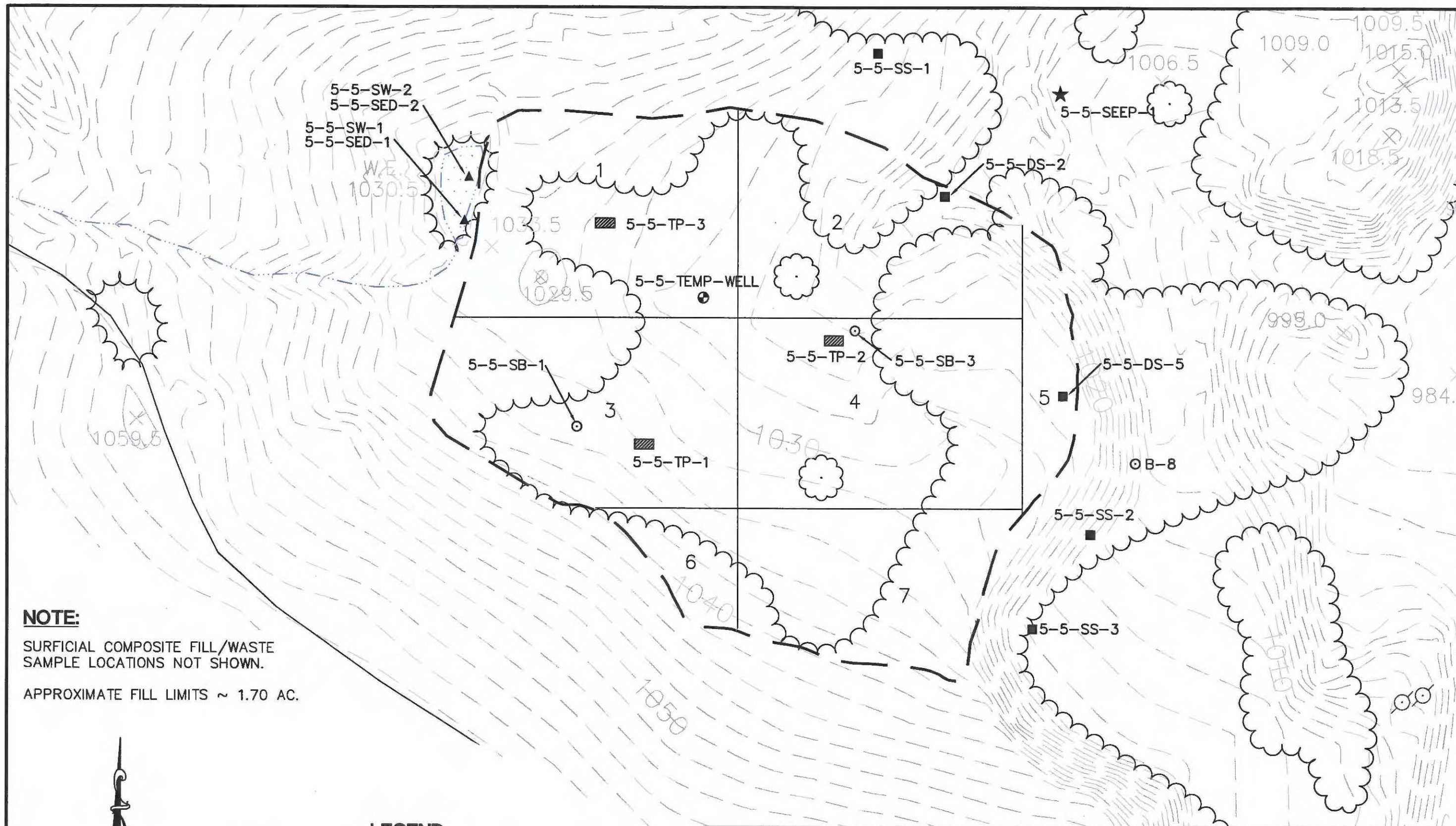
SCALE IN FEET



LEGEND

- APPROXIMATE FILL LIMITS
- ▲ SURFACE WATER/SEDIMENT
- SURFACE SOIL
- SOIL BORING
- ▨ TEST PIT
- ⊙ MONITORING WELL

 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-4 SAMPLING LOCATIONS PHASE I RFI LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: BTW CHKD. BY:	SCALE: 1" = 100'	DATE: JAN 2007	PROJECT NO: 060-770	FIGURE: 5



NOTE:

SURFICIAL COMPOSITE FILL/WASTE
SAMPLE LOCATIONS NOT SHOWN.

APPROXIMATE FILL LIMITS ~ 1.70 AC.

LEGEND

- APPROXIMATE FILL LIMITS
- ▲ SURFACE WATER/SEDIMENT
- SURFACE SOIL
- ⊙ SOIL BORING
- ▨ TEST PIT
- ⊗ MONITORING WELL



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DWN. BY: BTW

SCALE:

DATE:

PROJECT NO:

FIGURE:

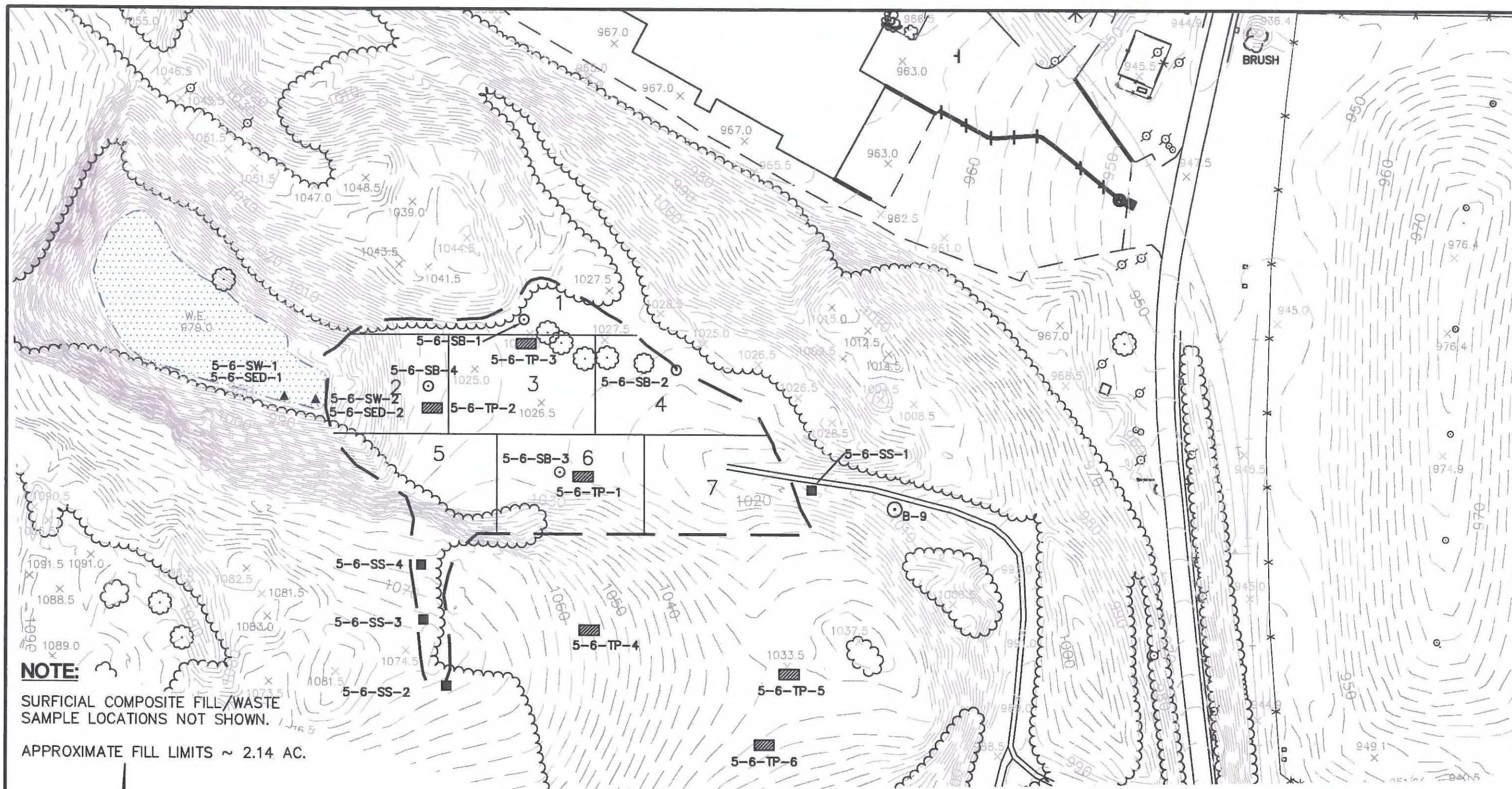
1" = 50'

JAN 2007

060-770

6

CHKD. BY:




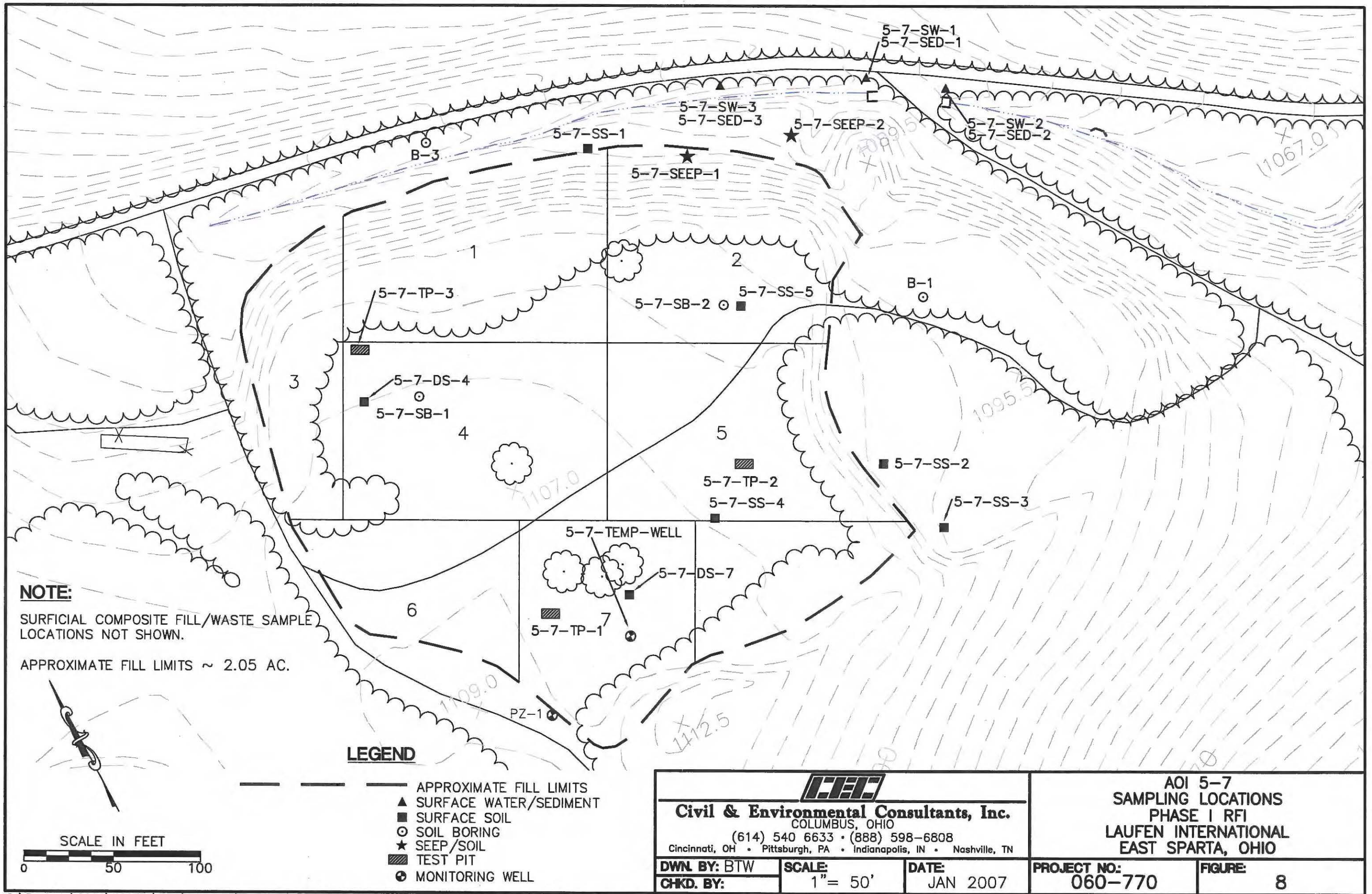
LEGEND

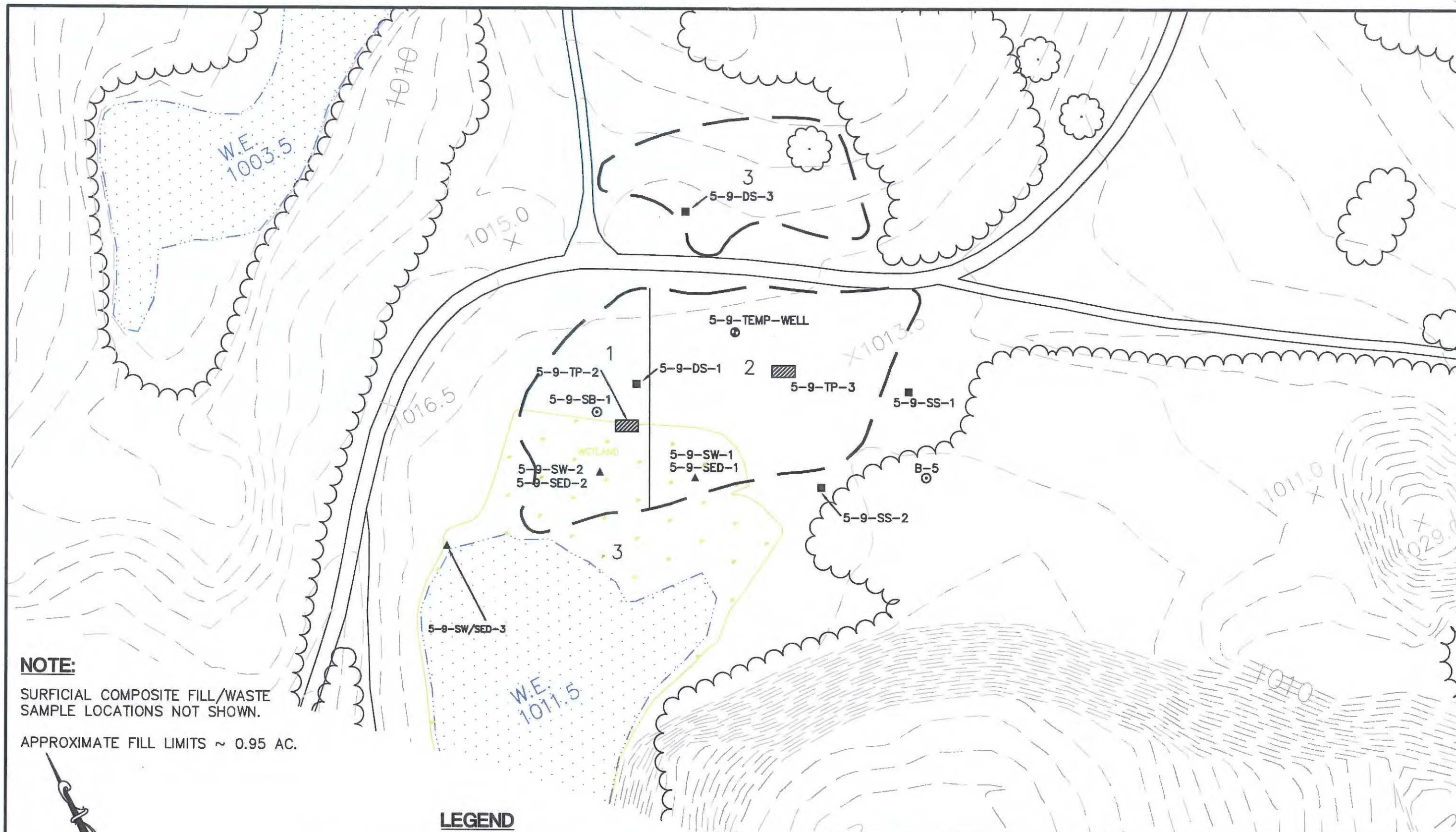
- APPROXIMATE FILL LIMITS
- ▲ SURFACE WATER/SEDIMENT
- SURFACE SOIL
- SOIL BORING
- ▨ TEST PIT
- ⊕ MONITORING WELL

SCALE IN FEET



 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-6 SAMPLING LOCATIONS PHASE I RFI LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: BTW CHKD. BY:	SCALE: 1" = 100'	DATE: JAN 2007	PROJECT NO: 060-770	FIGURE: 7





NOTE:

SURFICIAL COMPOSITE FILL/WASTE
SAMPLE LOCATIONS NOT SHOWN.

APPROXIMATE FILL LIMITS ~ 0.95 AC.

LEGEND

- APPROXIMATE FILL LIMITS
- ▲ SURFACE WATER/SEDIMENT
- SURFACE SOIL
- ⊙ SOIL BORING
- ★ SEEP/SOIL
- ▨ TEST PIT
- ⊕ MONITORING WELL



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DWN. BY: BTW

SCALE:

1" = 50'

DATE:

JAN 2007

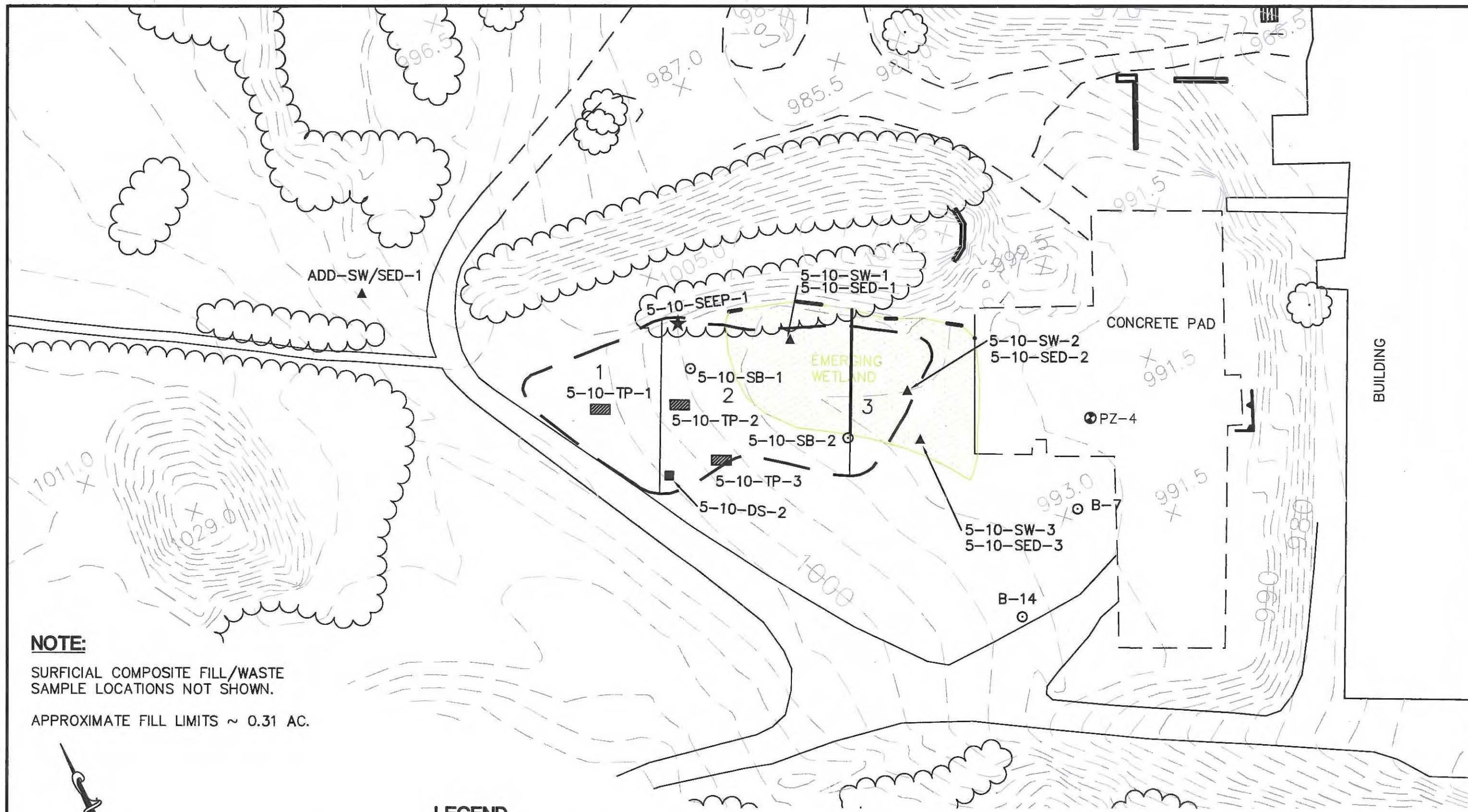
PROJECT NO:

060-770

FIGURE:

9

AOI 5-9
SAMPLING LOCATIONS
PHASE I RFI
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO




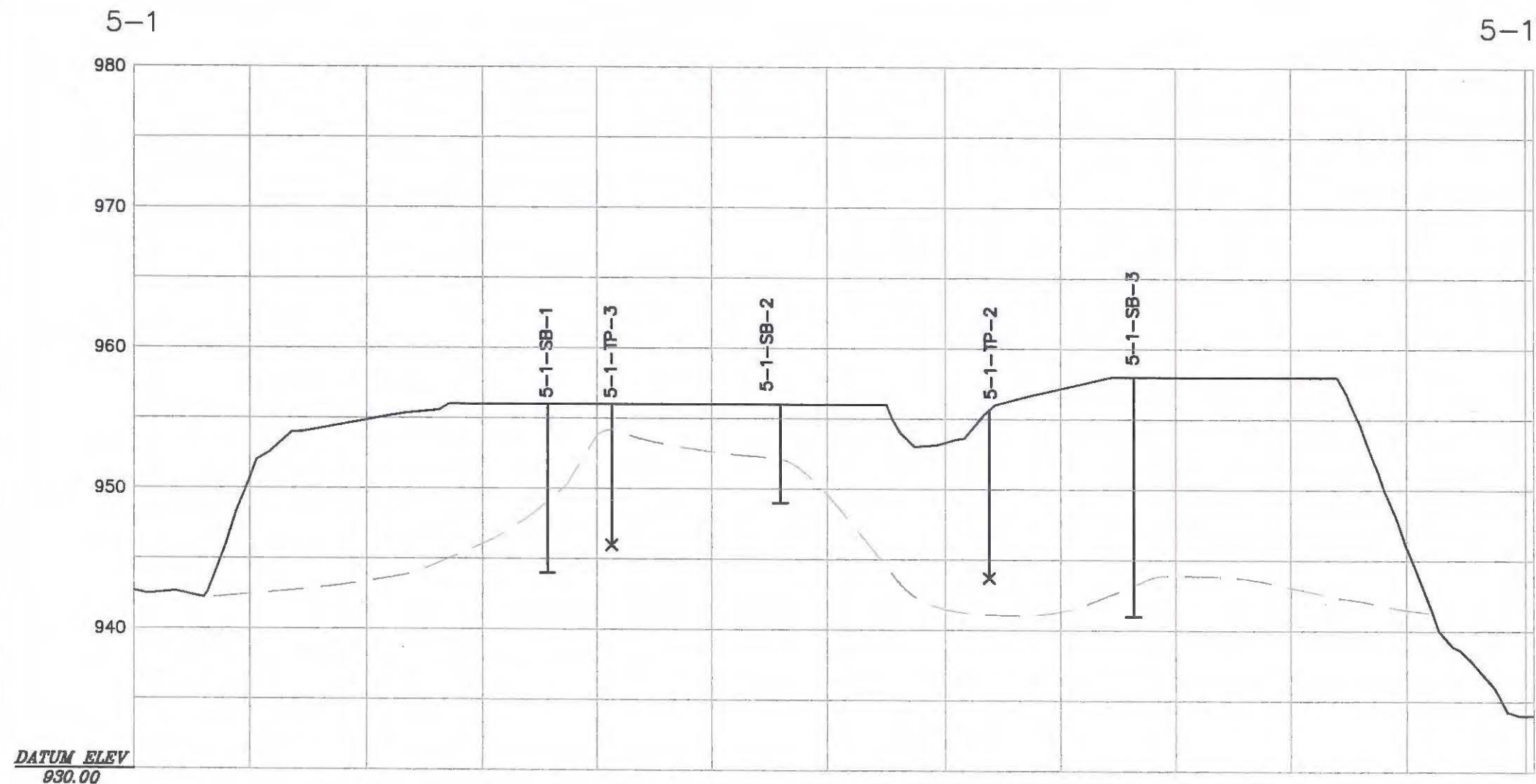
NOTE:

SURFICIAL COMPOSITE FILL/WASTE
SAMPLE LOCATIONS NOT SHOWN.
APPROXIMATE FILL LIMITS ~ 0.31 AC.

LEGEND

- — — — — APPROXIMATE FILL LIMITS
- ▲ SURFACE WATER/SEDIMENT
- SURFACE SOIL
- SOIL BORING
- ★ SEEP/SOIL
- ▨ TEST PIT
- ⊙ MONITORING WELL

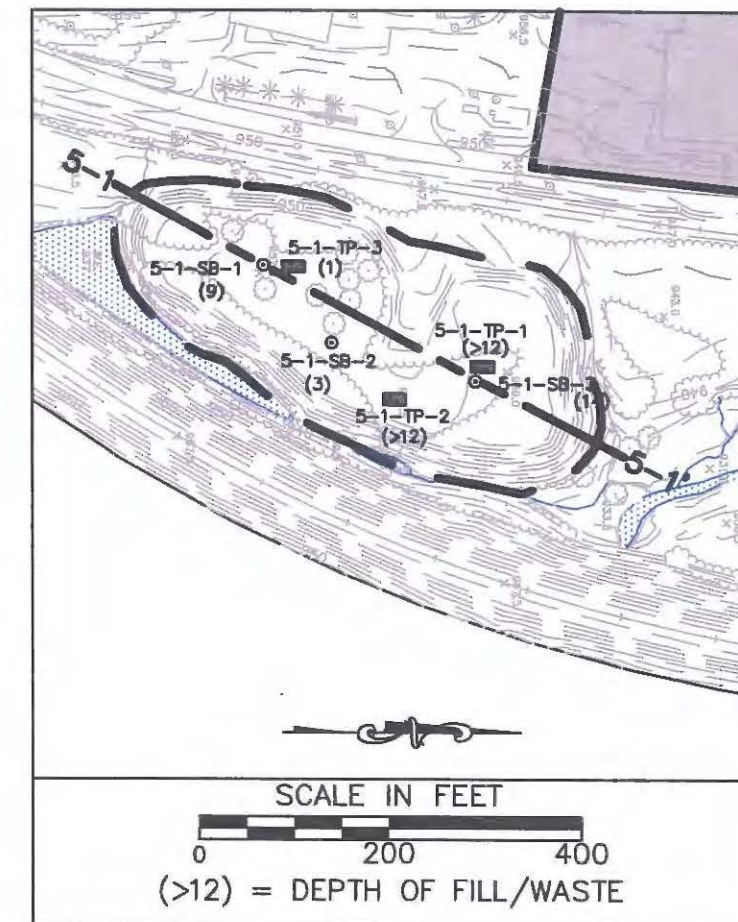
 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-10 SAMPLING LOCATIONS PHASE I RFI LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: BTW CHKD. BY:	SCALE: 1" = 50'	DATE: JAN 2007	PROJECT NO: 060-770	FIGURE: 10



SCALE: HORIZ. 1"=60'
VERT. 1"=10'


LEGEND

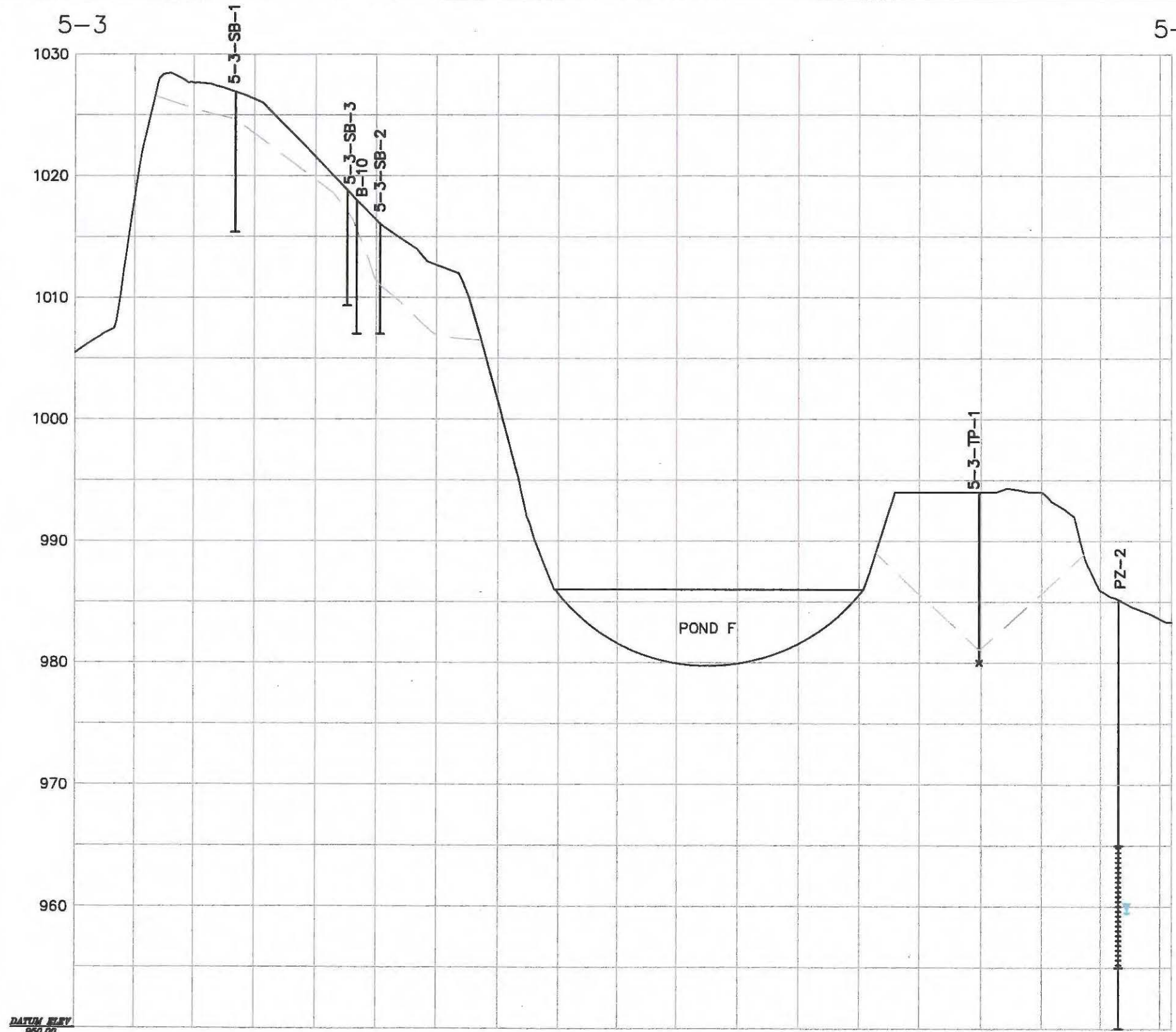
- — — — — APPROXIMATE DEPTH OF FILL/
WASTE MATERIAL
- ┆ SOIL BORING
- ┆ X TEST PIT



NOTE:

5-1 - SB-2 PROJECTED APPROXIMATELY 40'
NORTHWEST TO X-SECTION LINE

 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-1 CROSS SECTION 5-1 - 5-1' LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: JRS CHKD. BY:	SCALE: AS SHOWN	DATE: JAN 2007	PROJECT NO.: 060-770	FIGURE: 11

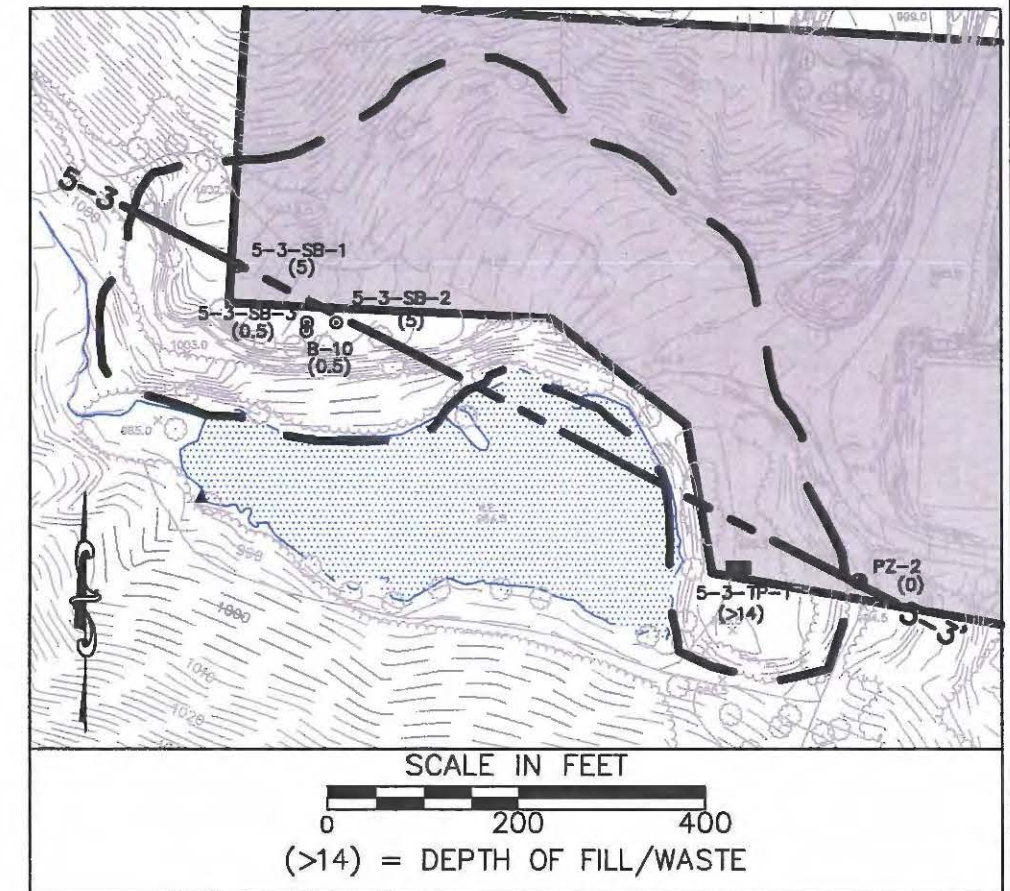


SCALE: HORIZ. 1"=100'
VERT. 1"=10'

NOTE:

5-3 - SB-3 PROJECTED APPROXIMATELY 20' NORTHEAST TO X-SECTION LINE
B-10 PROJECTED APPROXIMATELY 30' NORTHEAST TO X-SECTION LINE
5-3 - SB-2 PROJECTED APPROXIMATELY 5' NORTHEAST TO X-SECTION LINE

5-3'




LEGEND

SOIL BORING

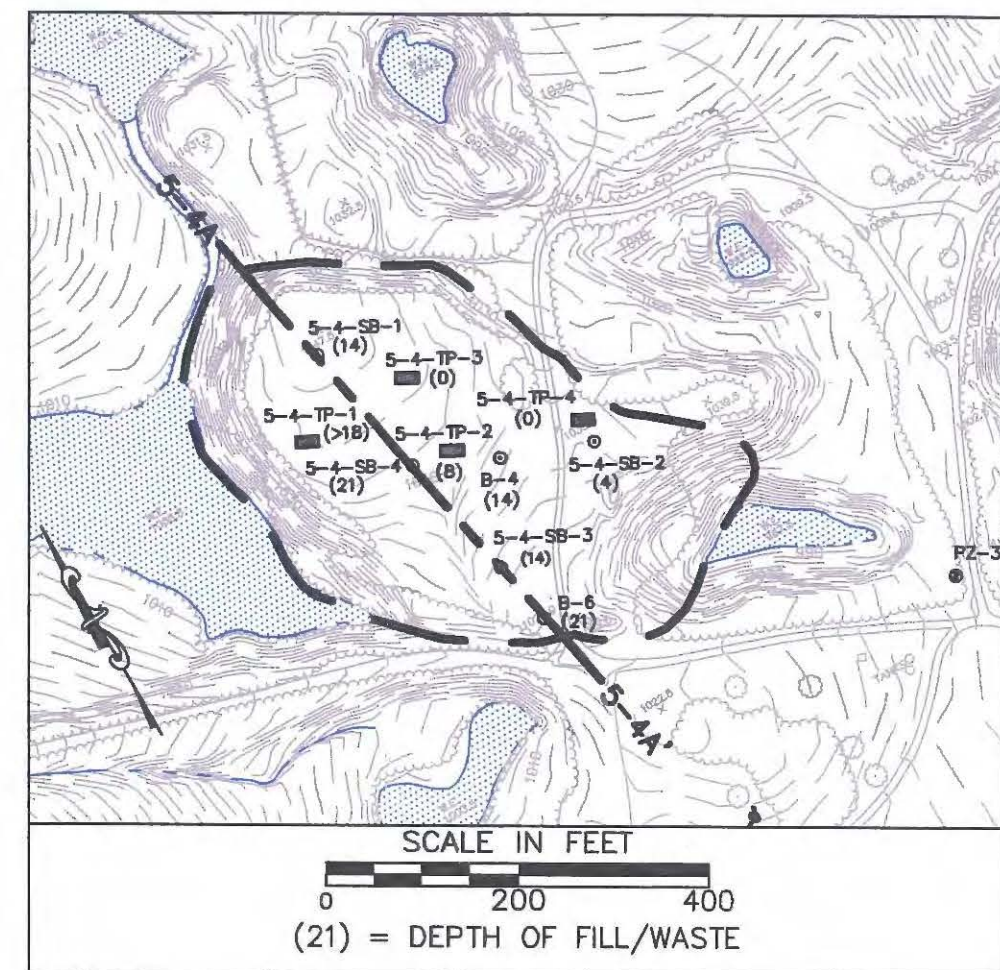
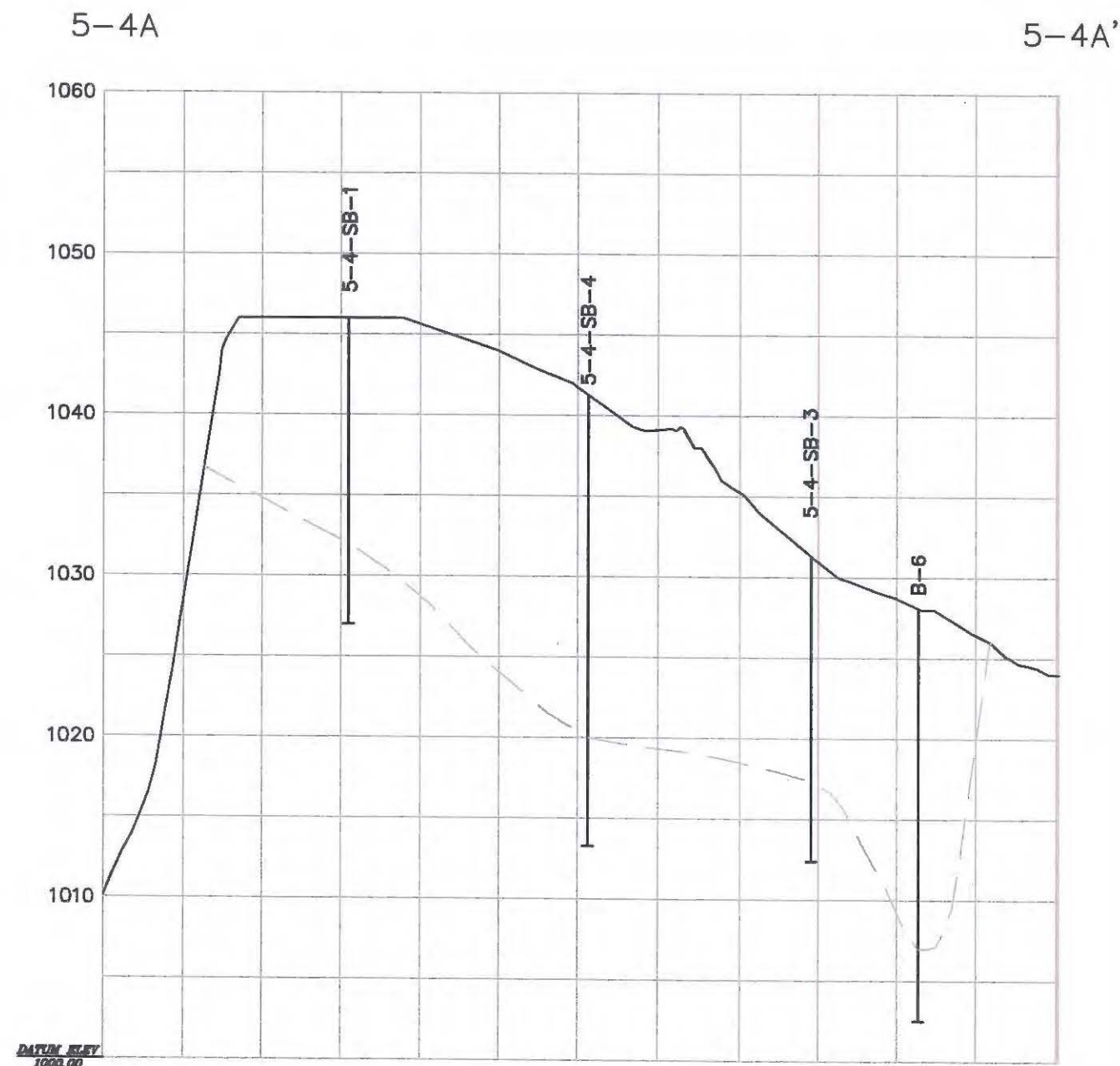
TEST PIT

WELL AND GROUNDWATER
LEVEL

APPROXIMATE DEPTH OF FILL/WASTE
MATERIAL

 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN		
DWN. BY: JRS	SCALE: AS SHOWN	DATE: JAN 2007
CHKD. BY:		

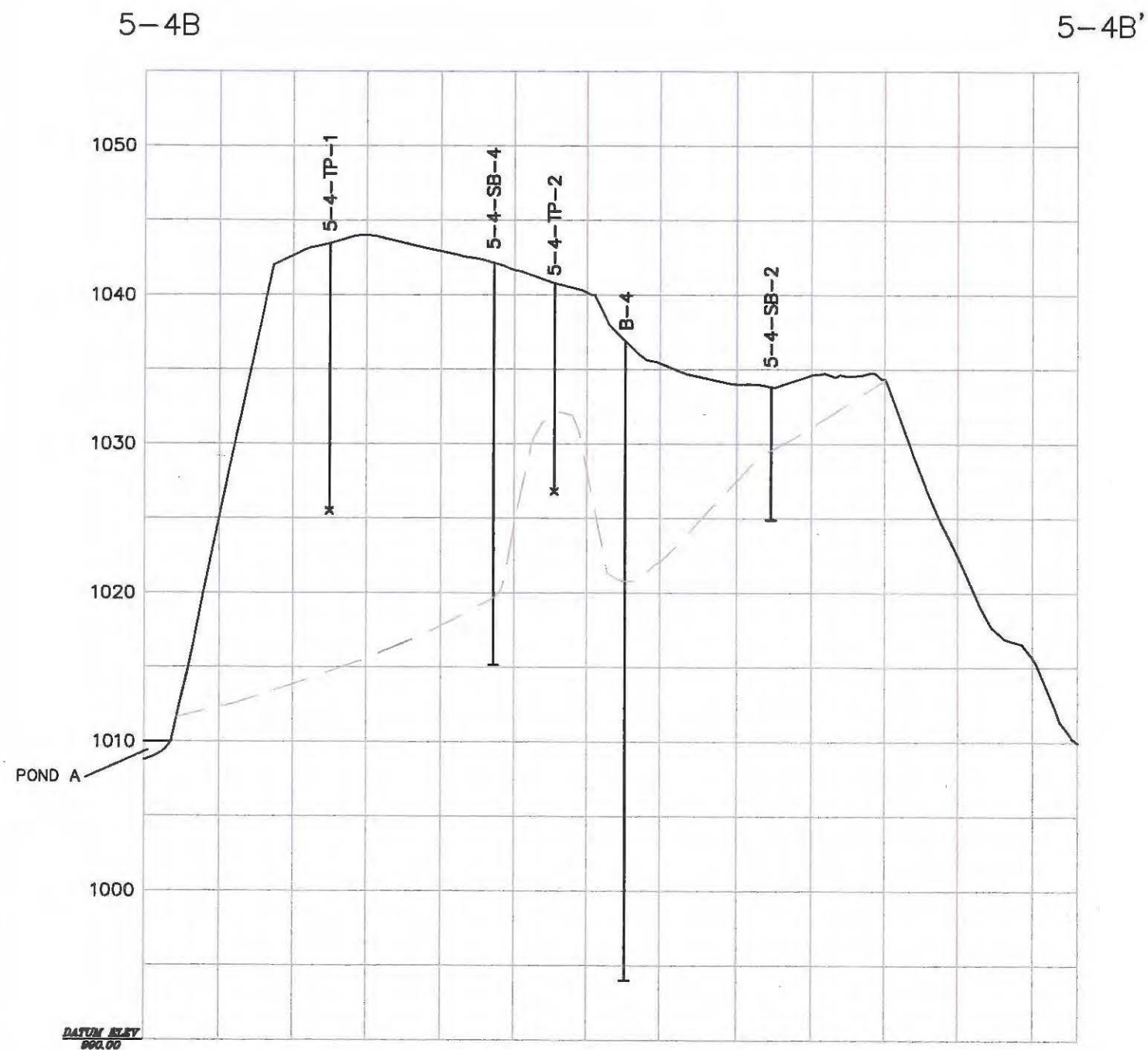
AOI 5-3 CROSS SECTION 5-3 - 5-3' LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
PROJECT NO: 060-770	FIGURE: 12



LEGEND

- ┆ SOIL BORING
- ┆ APPROXIMATE DEPTH OF FILL/WASTE MATERIAL
- ✕ TEST PIT

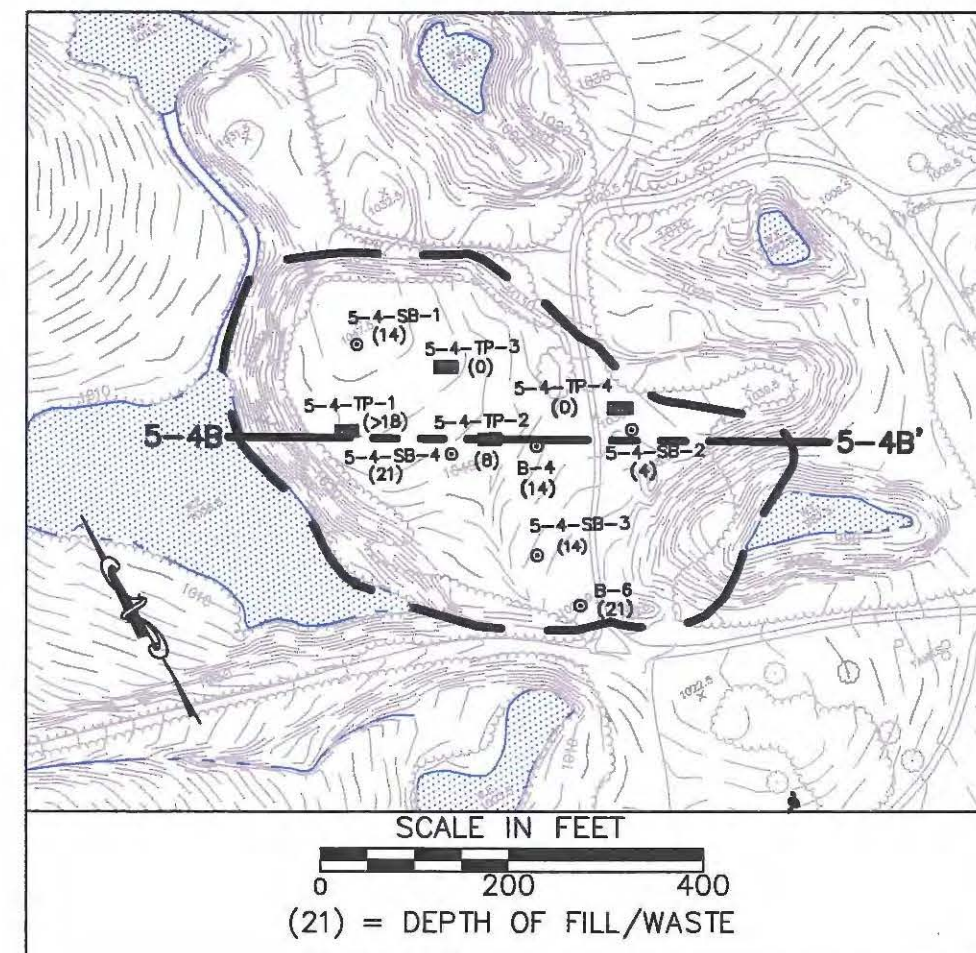
Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-4 CROSS SECTION 5-4A - 5-4A' LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: JRS CHKD. BY:	SCALE: AS SHOWN	DATE: JAN 2007	PROJECT NO.: 060-770	FIGURE: 13



SCALE: HORIZ. 1"=100'
VERT. 1"=10'


LEGEND

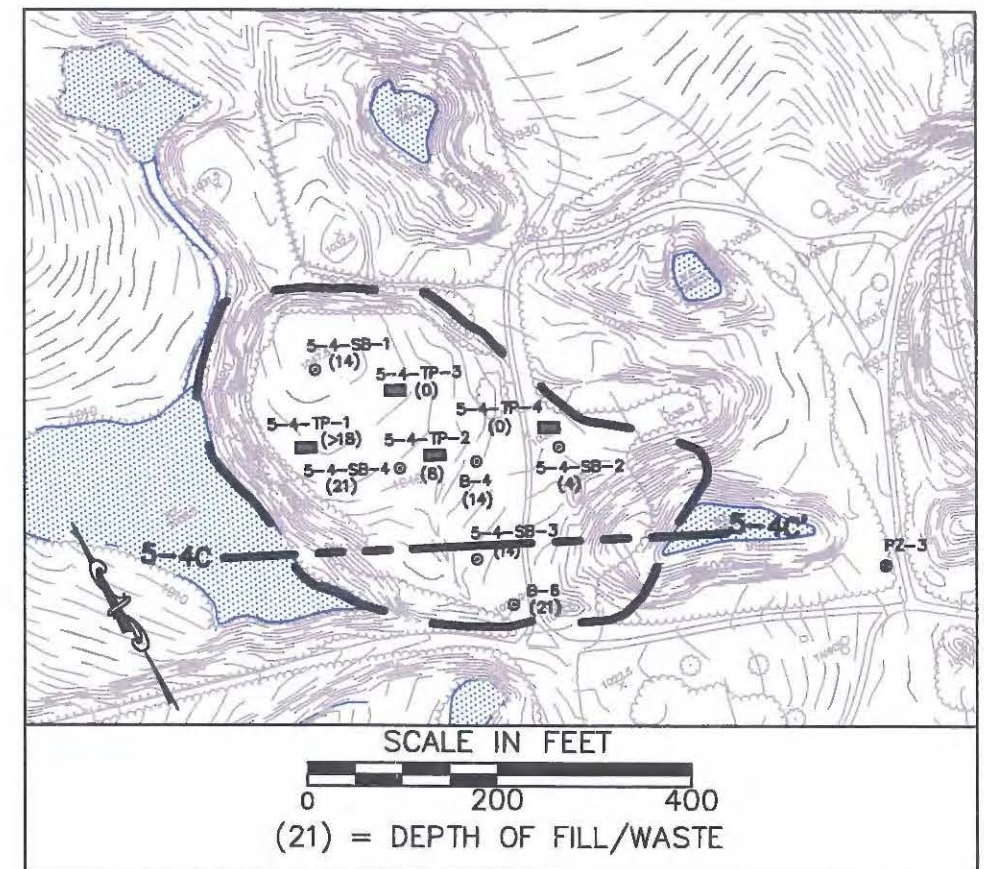
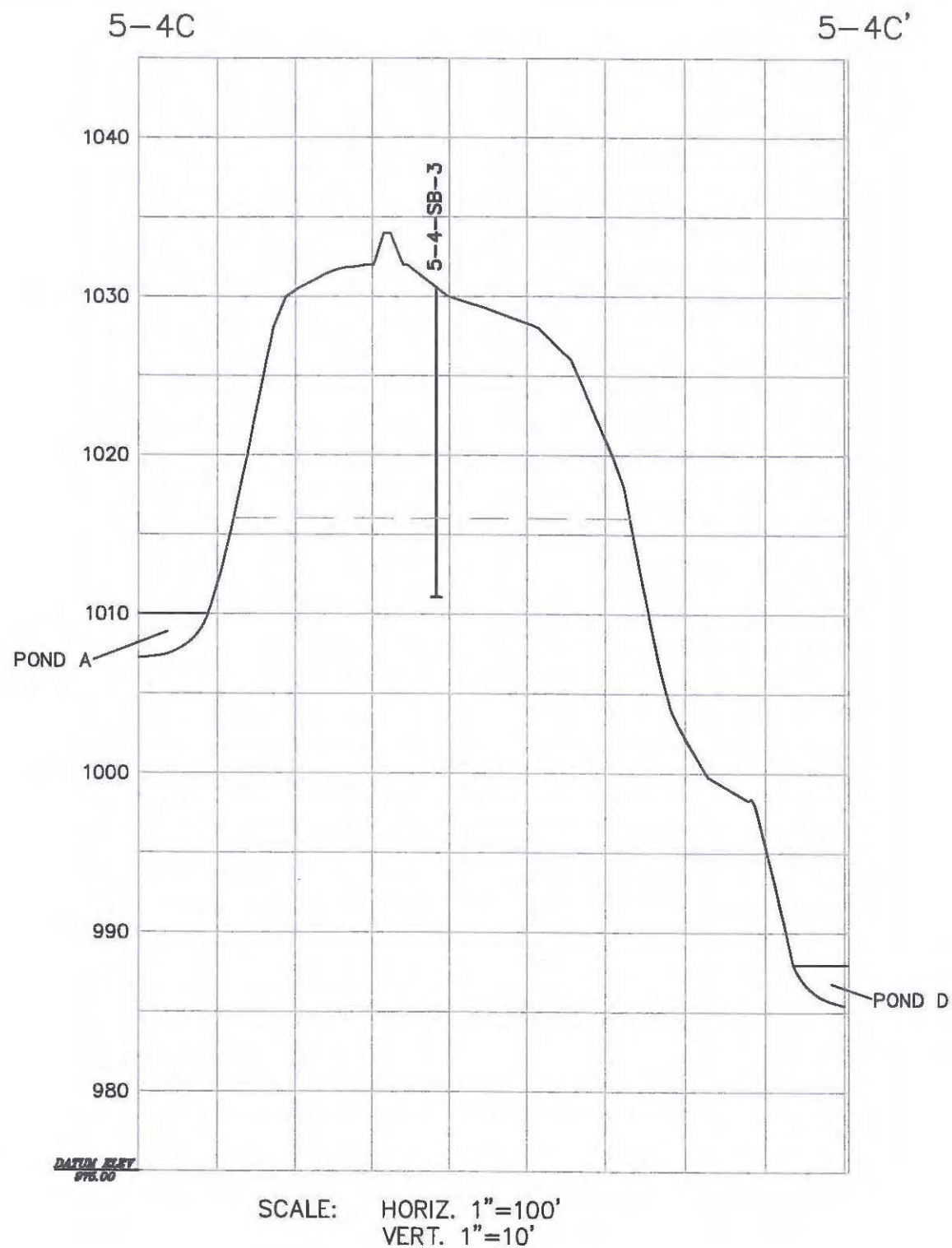
- — — — — APPROXIMATE DEPTH OF FILL/
WASTE MATERIAL
- | SOIL BORING
- |* TEST PIT



NOTE:

- 5-4 - SB-4 PROJECTED APPROXIMATELY 15' NORTH TO X-SECTION LINE
- B-4 PROJECTED APPROXIMATELY 10' NORTH TO X-SECTION LINE
- 5-4 - SB-2 PROJECTED APPROXIMATELY 15' NORTH TO X-SECTION LINE

 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-4 CROSS SECTION 5-4B - 5-4B' LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: JRS CHKD. BY:	SCALE: AS SHOWN	DATE: JAN 2007	PROJECT NO.: 060-770	FIGURE: 14




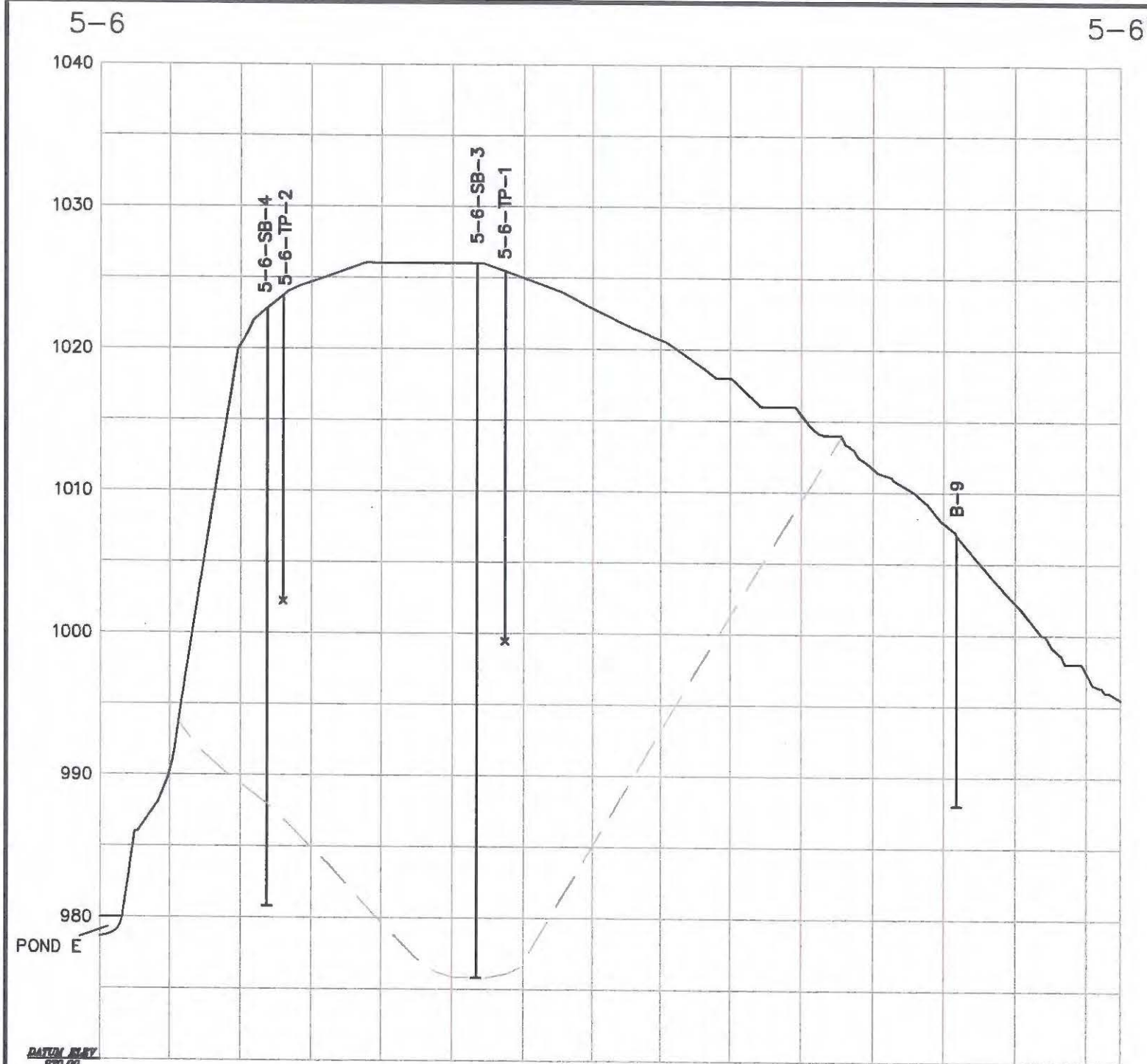
LEGEND

- — — — — APPROXIMATE DEPTH OF FILL/
WASTE MATERIAL
- | SOIL BORING
- | x TEST PIT

NOTE:

5-4 - SB-3 PROJECTED APPROXIMATELY 10' SOUTH TO X-SECTION LINE

 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-4 CROSS SECTION 5-4C - 5-4C' LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: JRS	SCALE: AS SHOWN	DATE: JAN 2007	PROJECT NO.: 060-770	FIGURE: 15
CHKD. BY:				



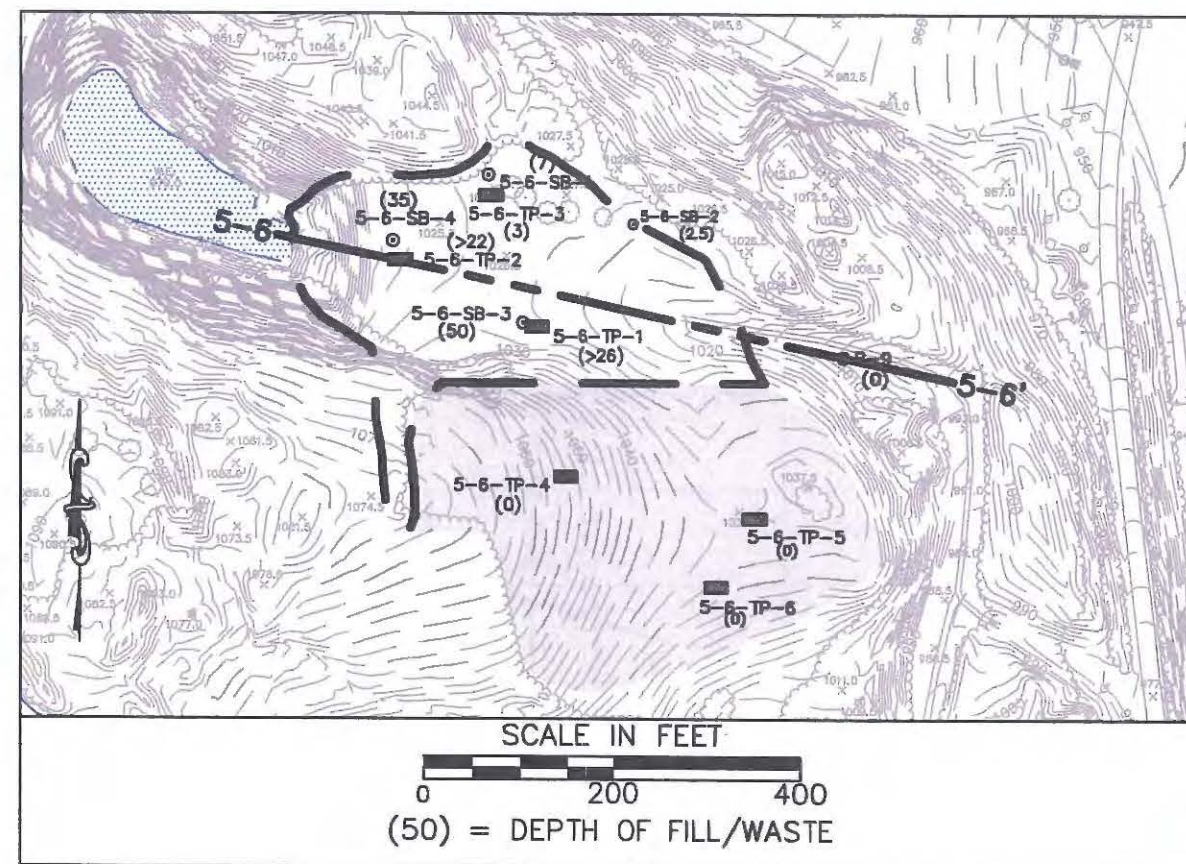
SCALE: HORIZ. 1"=100'
VERT. 1"=10'

LEGEND

— — — — — APPROXIMATE DEPTH OF FILL/WASTE MATERIAL


┆ SOIL BORING

┆ TEST PIT

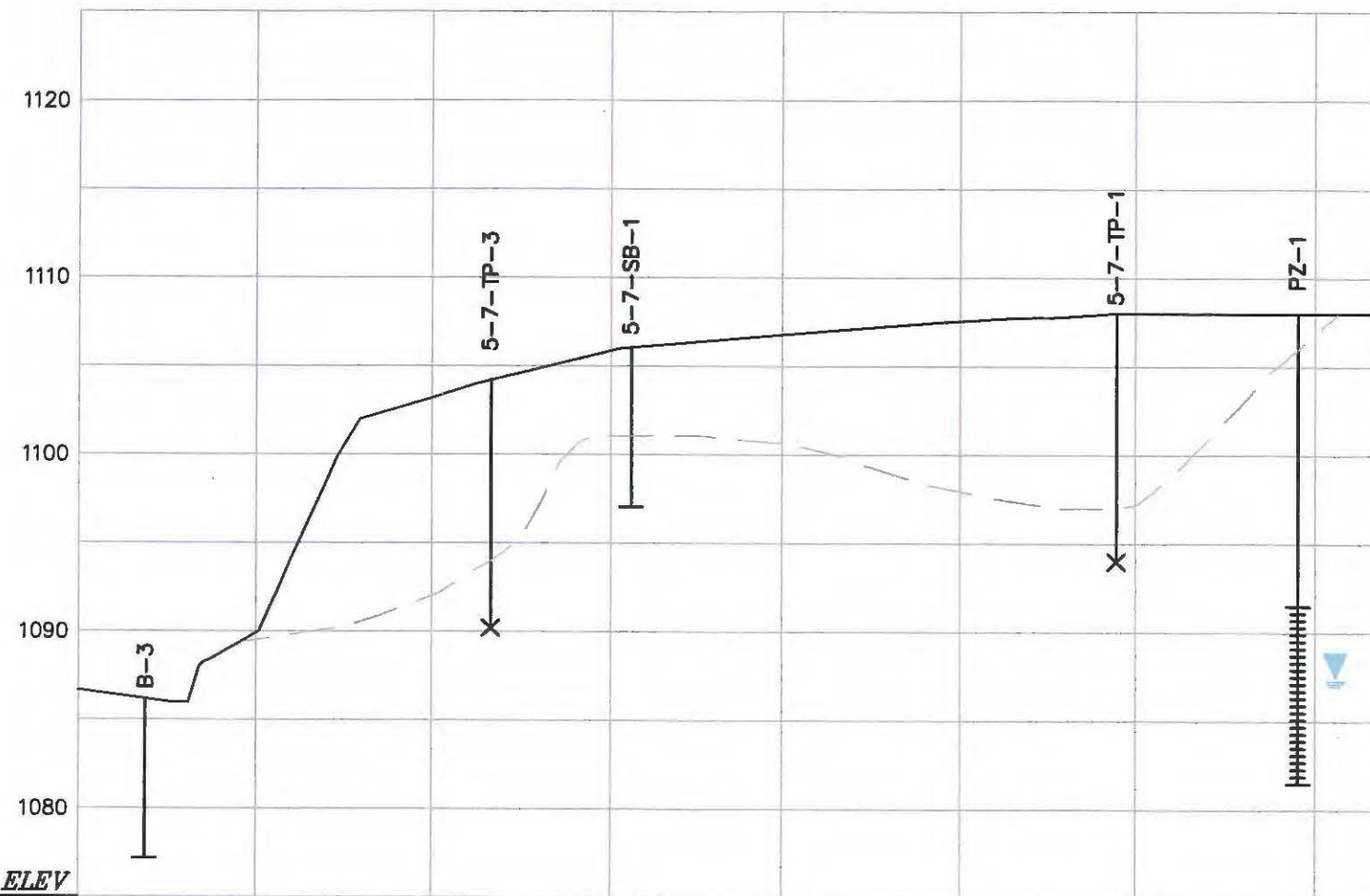


NOTE:

5-6 - SB-4 PROJECTED APPROXIMATELY 30' SOUTH TO X-SECTION LINE
5-6 - SB-3 PROJECTED APPROXIMATELY 40' NORTH TO X-SECTION LINE

 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-6 CROSS SECTION 5-6 - 5-6' LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: JRS	SCALE: AS SHOWN	DATE: JAN 2007	PROJECT NO: 060-770	FIGURE: 17
CHKD. BY:				

5-7A



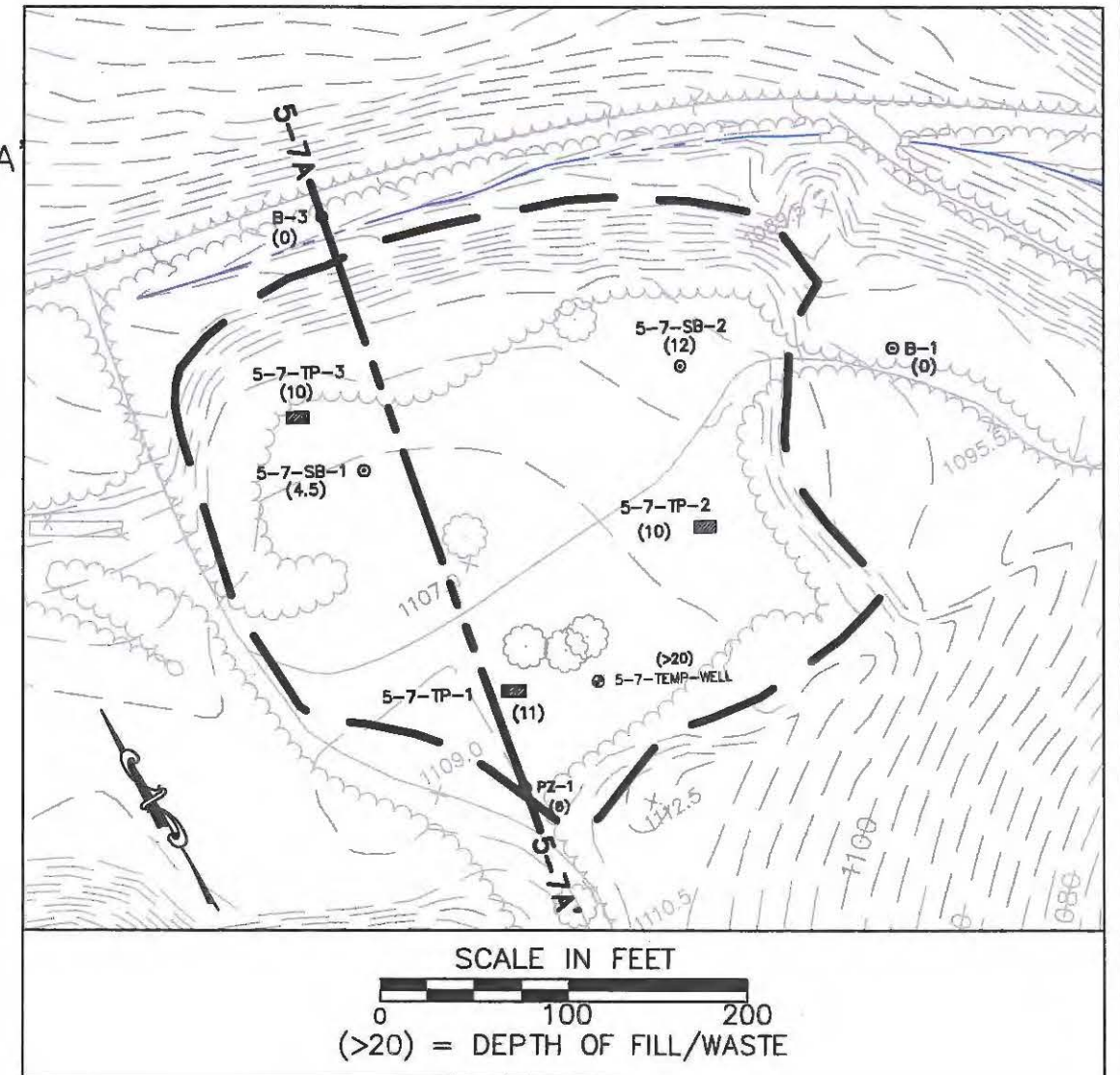
DATUM ELEV
1075.00

SCALE: HORIZ. 1"=50'
VERT. 1"=10'

LEGEND

- — — — — APPROXIMATE DEPTH OF FILL/
WASTE MATERIAL
- | SOIL BORING
- X TEST PIT
- | WELL AND GROUNDWATER
LEVEL

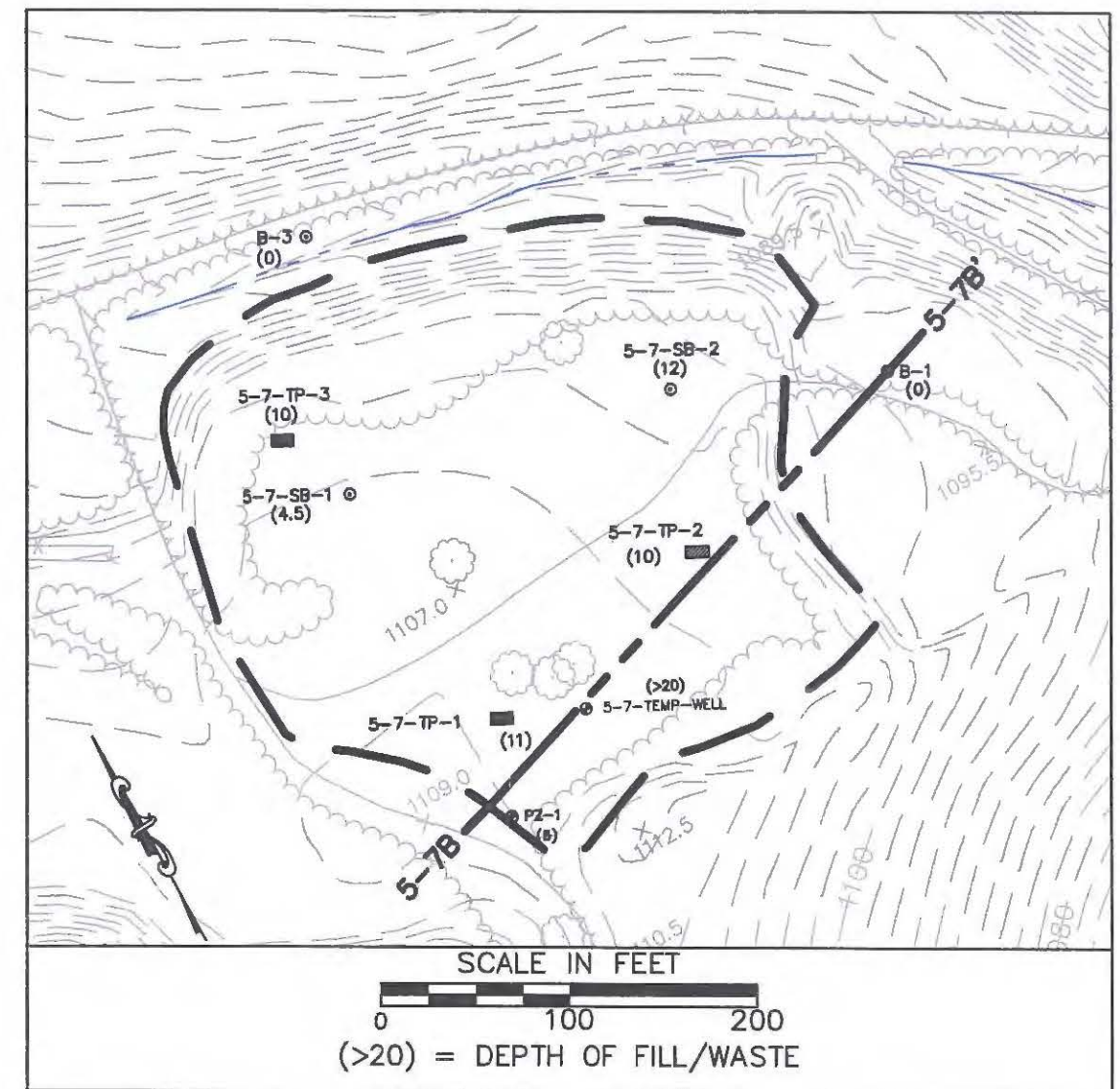
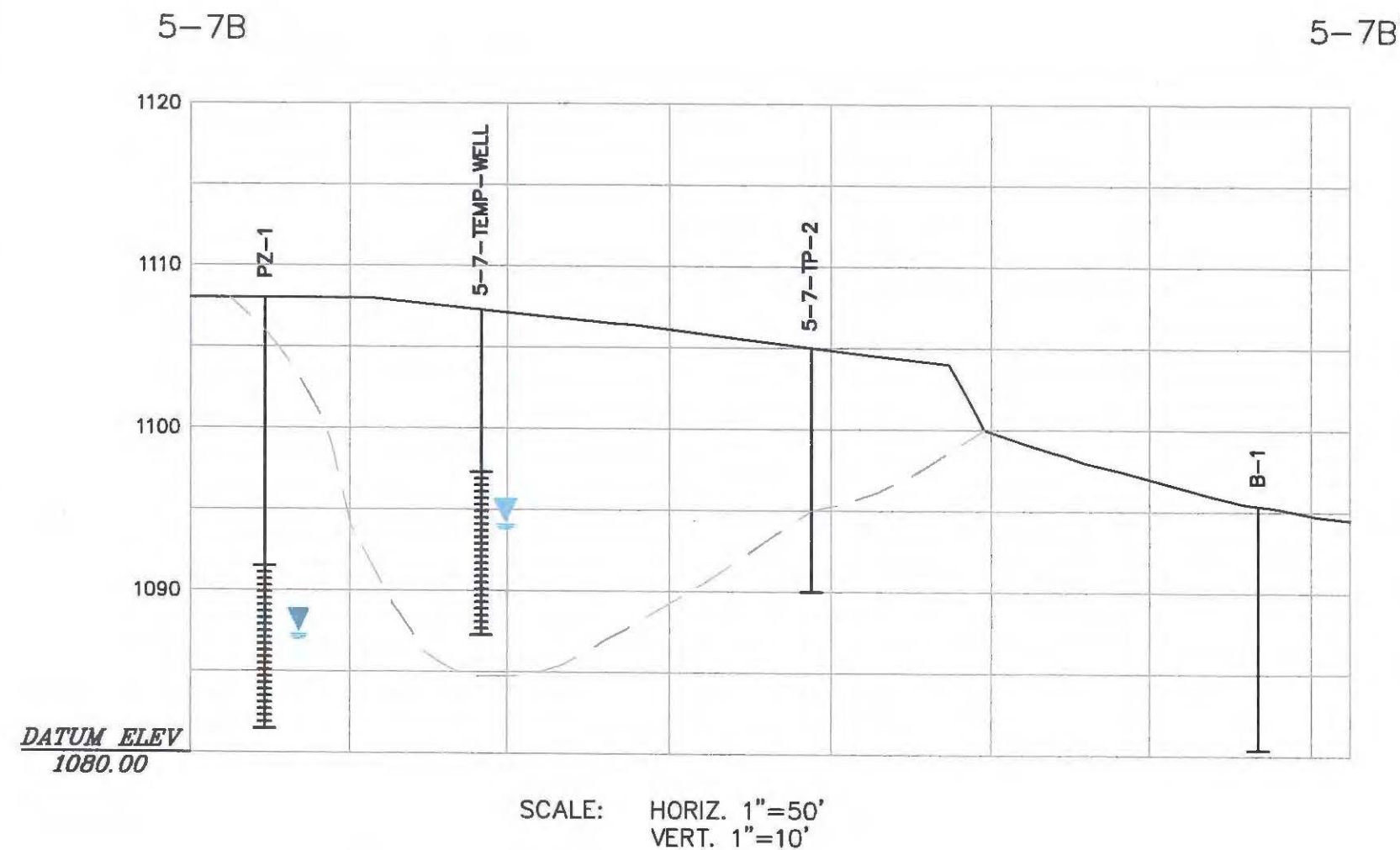
5-7A



NOTE:

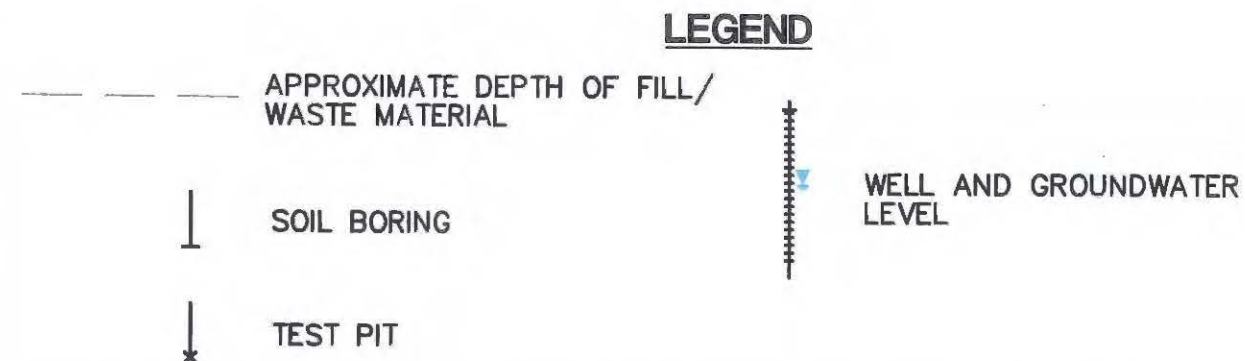
- 5-7 - TP-3 PROJECTED APPROXIMATELY 50' EAST TO X-SECTION LINE
- 5-7 - SB-1 PROJECTED APPROXIMATELY 25' EAST TO X-SECTION LINE
- 5-7 - TP-1 PROJECTED APPROXIMATELY 10' WEST TO X-SECTION LINE

Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-7 CROSS SECTION 5-7A - 5-7A' LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: JRS CHKD. BY:	SCALE: AS SHOWN	DATE: JAN 2007	PROJECT NO.: 060-770	FIGURE: 18



NOTE:

PZ-1 PROJECTED APPROXIMATELY 10' NORTH TO X-SECTION LINE
5-7 - TP-2 PROJECTED APPROXIMATELY 10' SOUTH TO X-SECTION LINE

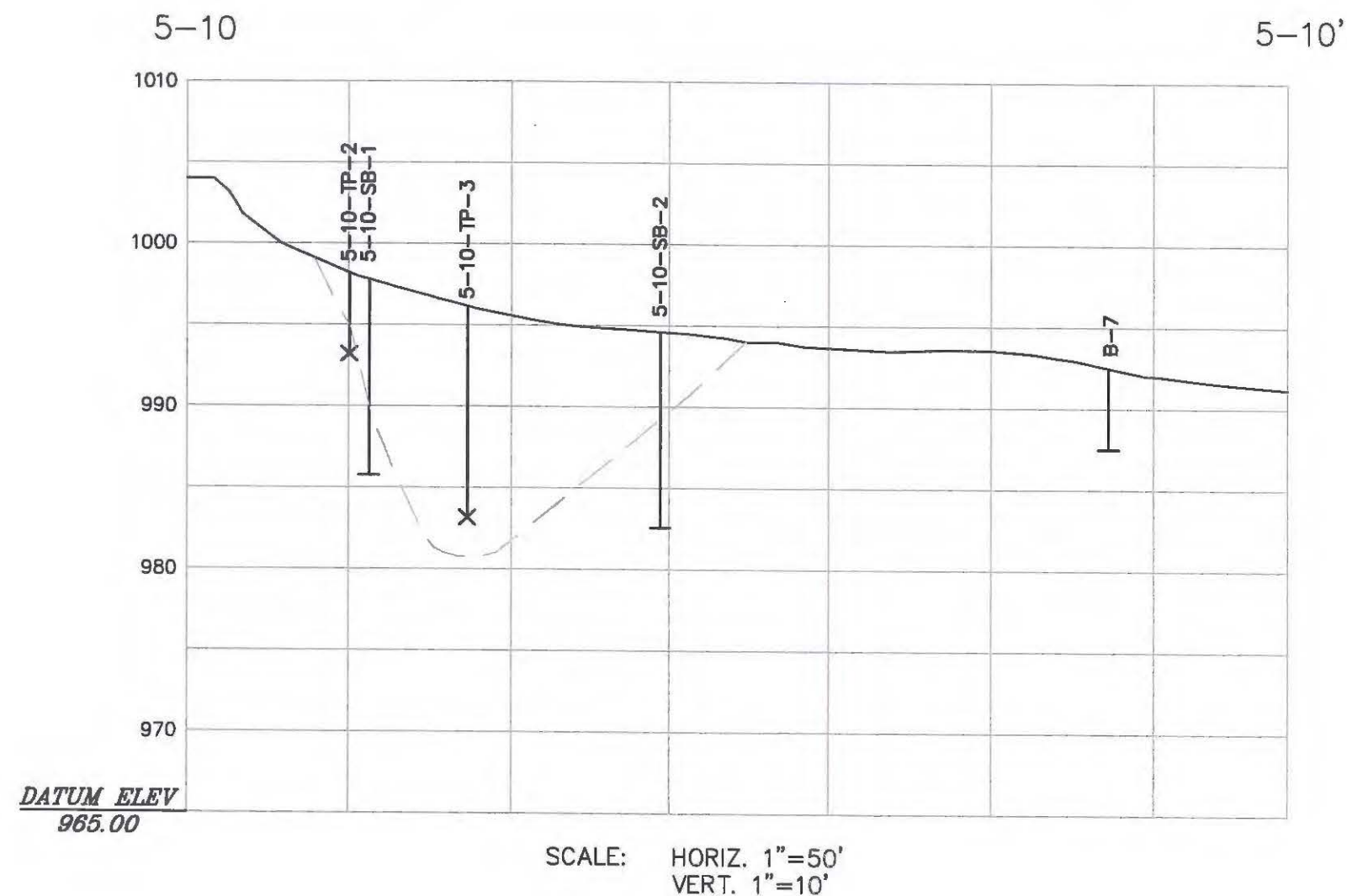


Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN		
DWN. BY: JRS	SCALE: AS SHOWN	DATE: JAN 2007
CHKD. BY:		

AOI 5-7
CROSS SECTION 5-7B - 5-7B'
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

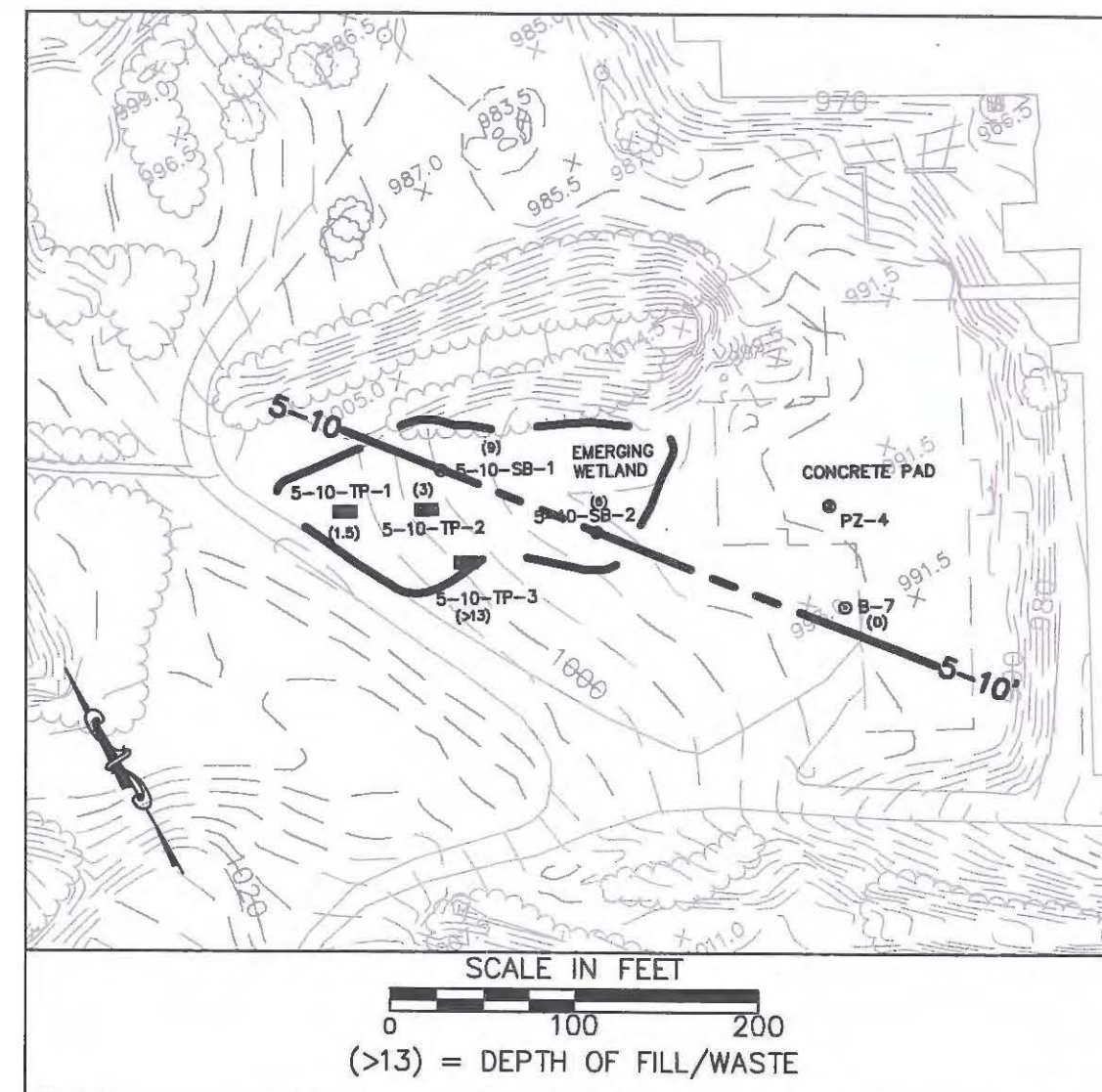
PROJECT NO:
060-770

FIGURE:
19



LEGEND

- — — — — APPROXIMATE DEPTH OF FILL/
WASTE MATERIAL
- ⊥ SOIL BORING
- × TEST PIT



NOTE:

B-7 PROJECTED APPROXIMATELY 15' SOUTH TO X-SECTION LINE


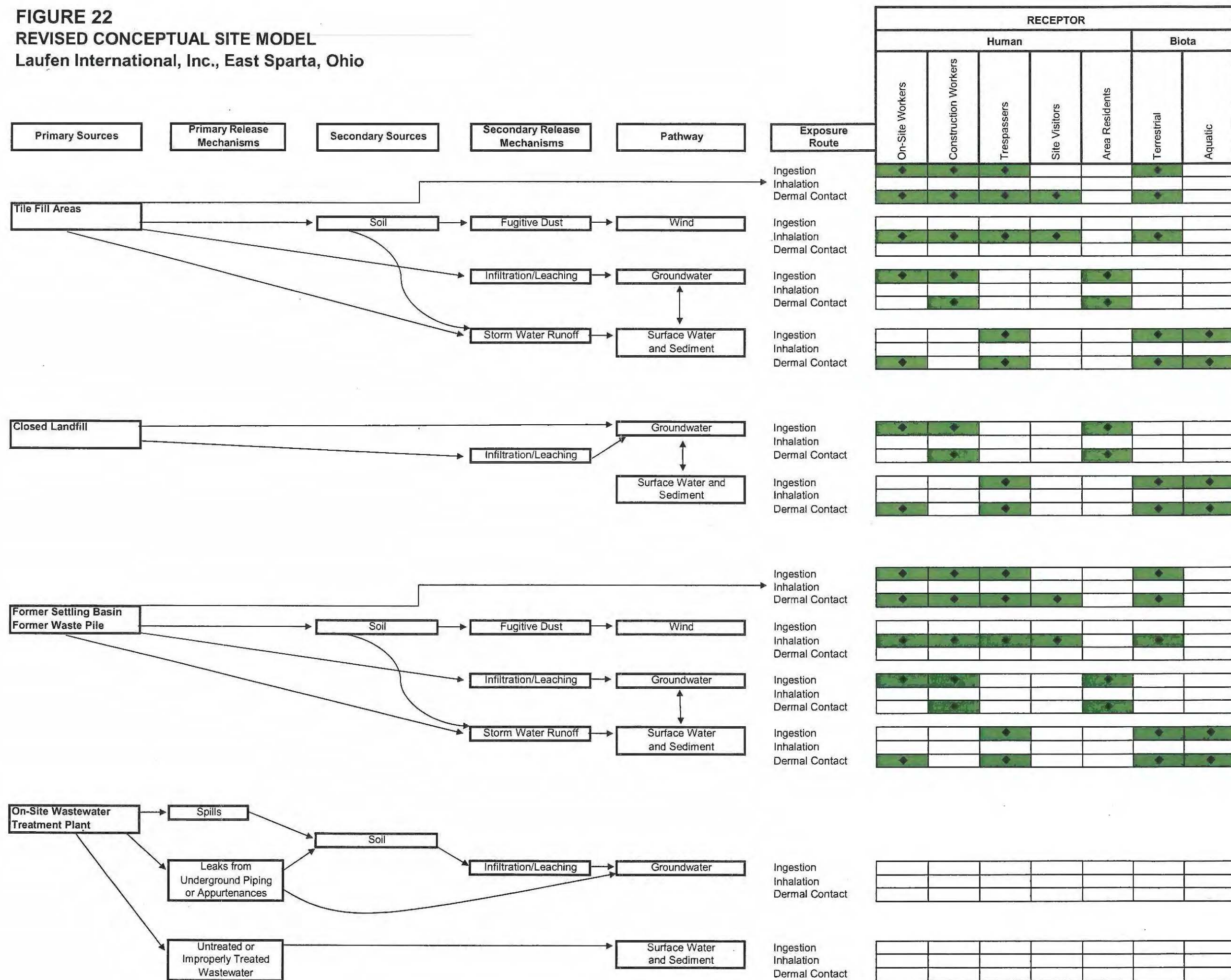
 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN			AOI 5-10 CROSS SECTION 5-10 - 5-10' LAUFEN INTERNATIONAL EAST SPARTA, OHIO	
DWN. BY: JRS CHKD. BY:	SCALE: AS SHOWN	DATE: JAN 2007	PROJECT NO.: 060-770	FIGURE: 21

FIGURE 22
REVISED CONCEPTUAL SITE MODEL
Laufen International, Inc., East Sparta, Ohio



TABLES

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TABLE 1
LIST OF AOIS INCLUDED IN THE RFI PHASE I
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

SWMU or AOC Identification	Name	Description	RFI AOI Designation	Work Required by Consent Decree
5-1	Photo Area #1	Apparent tile fill area southeast of former Sparta Mosaic Tile Plant	AOI-5-1	Yes
5-3	Photo Area #3	Unidentified area and wooden pallet disposal area southwest and west of former Sparta Mosaic Tile plant	AOI-5-3	Yes
5-4	Photo Area #4	Tile fill area northwest of U.S. Ceramic Tile plant (also identified as the Romany Fill area in the PR/VSI)	AOI-5-4	Yes
5-5	Photo Area #5	Apparent tile fill area northwest of former Sparta Mosaic Tile plant	AOI-5-5	Yes
5-6	Photo Area #6	Tile fill area south of U.S. Ceramic Tile plant	AOI-5-6	Yes
5-7	Photo Area #7	Apparent tile fill area northwest of U.S. Ceramic Tile plant	AOI-5-7	Yes
5-9	Photo Area #9	Apparent tile fill area west/northwest of U.S. Ceramic Tile plant	AOI-5-90	Yes
5-10	Photo Area 10#	Apparent tile fill area west of U.S. Ceramic Tile plant	AOI-5-1	Yes
6	Waste Water Treatment System	Below-grade conveyance trenches, lift stations, above-grade settling and treatment tanks, and filter press used to treat waste water from production operations	AOI-6	Yes

TABLE 2
SUMMARY OF PHASE I INVESTIGATION PROGRAM
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Number of Surface Fill/Waste Samples	Number of Test Pits	Number of Subsurface Waste Samples from Test Pits	Number of Soil Borings	Number of Subsurface Waste Samples from Soil Borings	Subsurface Release Soil Samples from Soil Borings and Test Pits	Number of Surface Release Soil Samples	Number of Water Samples from Seeps	Number of Soil Assoc with Seeps	Number of Surface Water Samples	Number of Sediment Samples	Permanent and Temporary Monitoring Wells and Groundwater Samples
AOI 5-1	9 (8) ¹	3 (3)	3 (6)	3 (3)	1 (TBD) ²	8 (6)	4 (4)	0 (0)	0 (0)	3 (3)	3 (3)	2 (0)
AOI 5-3	6 (5)	1 (1)	1 (2)	3 (3)	0 (TBD)	6 (6)	3 (3)	0 (0)	0 (0)	4 (4)	4 (4)	1 (1)
AOI 5-4	17 (14)	4 (4)	3 (8)	4 (4)	1 (TBD)	11 (8)	6 (6)	0 (0)	0 (0)	5 (5)	4 (5)	1 (2)
AOI 5-5	9 (7)	3 (3)	5 (6)	3 (3)	0 (TBD)	6 (6)	3 (3)	1 (0)	1 (0)	2 (2)	2 (2)	1 (1)
AOI 5-6	9 (7)	6 (6)	5 (12)	4 (4)	3 (TBD)	7 (8)	4 (4)	0 (0)	0 (0)	2 (3)	2 (3)	0 (1)
AOI 5-7	12 (8)	3 (3)	4 (6)	3 (3)	2 (TBD)	7 (6)	3 (3)	2 (2)	2 (2)	3 (2)	3 (2)	2 (1)
AOI 5-9	5 (2)	3 (3)	2 (6)	2 (2)	0 (TBD)	5 (4)	2 (2)	0 (0)	0 (0)	3 (3)	3 (3)	1 (1)
AOI 5-10	4 (3)	3 (3)	0 (6)	2 (2)	1 (TBD)	8 (4)	0 (0)	1 (1)	1 (1)	3 (3)	3 (3)	1 (1)
NW of AOI 5-10	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	1 (0)	0 (0)
	71 (54)	26 (26)	23 (52)	24 (24)	8 (TBD)	58 (48)	25 (25)	4 (3)	4 (3)	26 (25)	25 (25)	9 (8)

¹ 9 (8) - The first number indicates the actual amount, and the number in parenthesis indicates the amount proposed in the Work Plan

² TBD - To Be Determined

TABLE 3
SURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-1
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-1-CS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-CS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-CS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-CS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-CS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	24	mg/kg	410	0.142	5		J	2.4		J	2.4		J	4.9		J	4.6		J
Arsenic (Total)	3.1	mg/kg	1.6	5.7	2.6		J-	1.9		J-	1.4		J-	3.7		J-	1.8		J-
Barium (Total)	1500	mg/kg	67,000	1.04	1100	B	J	1400	B	J	1300	B	J	1300	B	J	1000	B	J
Beryllium (Total)	0.49	mg/kg	1,900	1.06	0.47			0.45			0.47			0.44			0.36		
Cadmium (Total)	2	mg/kg	450	0.0022	2			1.2			0.77			1.3			1.7		
Chromium (Total)	15	mg/kg	100,000	0.4	15		J-	9.8		J-	8.2		J-	11		J-	8.7		J-
Chromium, Hexavalent	2.7	mg/kg	64	NA	2.1	U	UJ	1.8	U	UJ	1.7	U	UJ	1.9	U	UJ	2.8	U	UJ
Cobalt (Total)	130	mg/kg	1,900	0.14	84		J-	130		J-	89		J-	100		J-	44		J-
Copper (Total)	260	mg/kg	41,000	5.4	14		J-	18		J-	10		J-	41		J-	16		J-
Lead (Total)	2800	mg/kg	800	0.0537	920			550			340			2800			710		
Mercury (Total)	0.15	mg/kg	310	0.1	0.14			0.11			0.03	J	J	0.048	J	J	0.048	J	J
Nickel (Total)	14	mg/kg	20,000	13.6	12		J-	13		J-	9		J-	14		J-	9.1		J-
Selenium (Total)	0.59	mg/kg	5,100	0.0276	0.59		J-	0.46		J-	0.3		J-	0.47		J-	0.57		J-
Silver (Total)	25	mg/kg	5,100	4.04	2.1			25			0.49			0.65			2.4		
Thallium (Total)	0.22	mg/kg	67	0.0569	0.093	J	J	0.082	J	J	0.088	J	J	0.11		J	0.085	J	J
Vanadium (Total)	13	mg/kg	1,000	1.59	13		J	12		J	9		J	12		J	10		J
Zinc (Total)	1800	mg/kg	100,000	6.62	1800	B	J	940	B	J	520	B	J	1400	B	J	1100	B	J

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-1-CS-6	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-CS-7	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-CS-8	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-CS-DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-DS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	24	mg/kg	410	0.142	3.6		J	24		J	8.4		J	3.4		J	3.8		J
Arsenic (Total)	3.1	mg/kg	1.6	5.7	3		J-	2		J-	1.7		J-	2.7		J-	1.7		J-
Barium (Total)	1500	mg/kg	67,000	1.04	860	B	J	940	B	J	1200	B	J	820	B	J	1500	B	J
Beryllium (Total)	0.49	mg/kg	1,900	1.06	0.49			0.48			0.29			0.48			0.46		
Cadmium (Total)	2	mg/kg	450	0.0022	1.1			0.97			0.62			1.3			0.95		
Chromium (Total)	15	mg/kg	100,000	0.4	11		J-	9.4		J-	6.7		J-	9		J-	8.3		J-
Chromium, Hexavalent	2.8	mg/kg	64	NA	1.8	U	UJ	2.7		J	2.3	U	UJ	1.8	U	UJ	2.2	U	UJ
Cobalt (Total)	130	mg/kg	1,900	0.14	100		J-	65		J-	38		J-	120		J-	110		J-
Copper (Total)	260	mg/kg	41,000	5.4	25		J-	260		J-	9.5		J-	24		J-	16		J-
Lead (Total)	2800	mg/kg	800	0.0537	480			350			150			590			420		
Mercury (Total)	0.15	mg/kg	310	0.1	0.044	J	J	0.037	J	J	0.1			0.043	J	J	0.15		
Nickel (Total)	14	mg/kg	20,000	13.6	13		J-	11		J-	6		J-	12		J-	10		J-
Selenium (Total)	0.59	mg/kg	5,100	0.0276	0.57		J-	0.25		J-	0.38		J-	0.56		J-	0.32		J-
Silver (Total)	25	mg/kg	5,100	4.04	1.8			1			0.76			2.1			1.7		
Thallium (Total)	0.22	mg/kg	67	0.0569	0.11		J	0.12		J	0.22		J	0.091	J	J	0.095	J	J
Vanadium (Total)	13	mg/kg	1,000	1.59	11		J	10		J	8.6		J	10		J	11		J
Zinc (Total)	1800	mg/kg	100,000	6.62	490	B	J	520	B	J	230	B	J	460	B	J	550	B	J

Shading indicates the maximum concentration of each COPL.

J - The associated numerical value is an estimated quantity.

J- - The associated numerical value is an estimated quantity, potentially biased low.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level

TABLE 4
SUBSURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-1
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		5-1-SB-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-TP-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-TP-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-TP-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	82	mg/kg	0.4		J+	0.57		J+	29			82		
Arsenic (Total)	3.7	mg/kg	2.4			0.93		J+	3.7			2.2		
Barium (Total)	900	mg/kg	150			690			900			590		
Beryllium (Total)	0.87	mg/kg	0.87			0.6			0.6			0.16		
Cadmium (Total)	4.1	mg/kg	0.37			4.1			2.9			1.4		
Chromium (Total)	19	mg/kg	19			7.5			13			19		
Chromium, Hexavalent	ND	mg/kg	2	U	UJ	2	U	U	2	U	U	3.2	U	UJ
Cobalt (Total)	570	mg/kg	27			12			570			4.1		
Copper (Total)	71	mg/kg	28		J	13		J	39		J	71		J
Lead (Total)	1300	mg/kg	76			56			340			1300		
Mercury (Total)	0.052	mg/kg	0.05	J	U	0.05	J	U	0.052		J+	0.05	J	U
Nickel (Total)	28	mg/kg	28			10			22			19		
Selenium (Total)	0.49	mg/kg	0.44			0.25			0.49			0.22		
Silver (Total)	0.24	mg/kg	0.18			0.12			0.19			0.24		
Thallium (Total)	0.16	mg/kg	0.16			0.13			0.11			0.03	J	J
Vanadium (Total)	20	mg/kg	20			8.3			8.2			5.7		
Zinc (Total)	300	mg/kg	180			94			3200			2900		

Shading indicates the maximum concentration of each

- J - The associated numerical value is an estimated quantity.
- J+ - The associated numerical value is an estimated quantity, potentially biased high.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

TABLE 5
SURFACE SOIL SAMPLES
AOI 5-1
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-1-SS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SS-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	1.8			3.2			5.8			1.5			2.4		
Arsenic (Total)	mg/kg	1.6	5.7	12			140			240			12			13		
Barium (Total)	mg/kg	67,000	1.04	150		J	170		J	250		J	230		J	190		J
Beryllium (Total)	mg/kg	1,900	1.06	0.83			0.72			0.85			0.84			0.75		
Cadmium (Total)	mg/kg	450	0.0022	0.61			0.66			0.95			1.6			0.63		
Chromium (Total)	mg/kg	100,000	0.4	19			17			21			60			18		
Chromium, Hexavalent	mg/kg	64	NA	1.9	J	UJ	1.6	U	UJ	2	U	UJ	2.7	J	UJ	1.7	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	20			20			16			19			26		
Copper (Total)	mg/kg	41,000	5.4	41			31			34			44			60		
Lead (Total)	mg/kg	800	0.0537	100			140			56			200			170		
Mercury (Total)	mg/kg	310	0.1	0.071		U	0.071		U	0.072		U	0.18			0.082		U
Nickel (Total)	mg/kg	20,000	13.6	27			20			21			48			24		
Selenium (Total)	mg/kg	5,100	0.0276	0.69		J	0.78		J	0.76		J	1.1		J	0.76		J
Silver (Total)	mg/kg	5,100	4.04	0.22			0.2			0.19			0.49			0.25		
Thallium (Total)	mg/kg	-	0.0569	0.24			0.33			0.31			0.37			0.23		
Vanadium (Total)	mg/kg	1,000	1.59	18			19			19			25			17		
Zinc (Total)	mg/kg	100,000	6.62	220			210			350			910			280		

J - The associated numerical value is an estimated quantity.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 6
SUBSURFACE SOIL SAMPLES
AOI 5-1
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-1-SB-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SB-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SB-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SB-2-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SB-2-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.31		J+	0.29		J+	0.36		J+	0.95		J+	0.28		J+
Arsenic (Total)	mg/kg	1.6	5.7	29	1.3			0.89		J+	2.1			2.3			1.9		
Barium (Total)	mg/kg	67,000	1.04	1,600	180			75			180			730			84		
Beryllium (Total)	mg/kg	1,900	1.06	63	1.1			1.1			0.92			0.66			0.94		
Cadmium (Total)	mg/kg	450	0.0022	8	0.05	U	U	0.05	U	U	0.17			1.7			0.14		
Chromium (Total)	mg/kg	100,000	0.4	38	13		J+	10		J+	21			160		J+	22		
Chromium, Hexavalent	mg/kg	64	NA	38	1.5	U	UJ	1.6	U	UJ	2	U	UJ	1.1	U	UJ	2	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	NONE	6.6			6.4			24			250			22		
Copper (Total)	mg/kg	41,000	5.4	NONE	19		J	31		J	21		J	18		J	22		J
Lead (Total)	mg/kg	800	0.0537	NONE	10			13			25			160			21		
Mercury (Total)	mg/kg	310	0.1	NONE	0.076		J+	0.056		J+	0.05	J	U	0.05	J	U	0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	130	18			15			32			77			34		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.99		J-	0.8		J-	0.34			0.63			0.31		
Silver (Total)	mg/kg	5,100	4.04	34	0.063	J	J	0.043	J	J	0.11			0.13			0.14		
Thallium (Total)	mg/kg	67	0.0569	NONE	0.14			0.12			0.19			0.14			0.2		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	25			23			18			12			19		
Zinc (Total)	mg/kg	100,000	6.62	12,000	26	B	J	15	B	J	130			920			120		

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-1-SB-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SB-3-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-TP-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-TP-3-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	1			0.46		J+	0.8		J+	0.61		J+
Arsenic (Total)	mg/kg	1.6	5.7	29	12			2.3			3.8			2.5		
Barium (Total)	mg/kg	67,000	1.04	1,600	65			97			1200			1100		
Beryllium (Total)	mg/kg	1,900	1.06	63	1.2			1.2			0.82			0.68		
Cadmium (Total)	mg/kg	450	0.0022	8	0.15			0.16			0.58			0.63		
Chromium (Total)	mg/kg	100,000	0.4	38	21			25			18			14		J+
Chromium, Hexavalent	mg/kg	64	NA	38	2.2	U	UJ	1.8	U	UJ	1.4	U	UJ	1.8	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	NONE	16			21			250			270		
Copper (Total)	mg/kg	41,000	5.4	NONE	32		J	30		J	27		J	27		J
Lead (Total)	mg/kg	800	0.0537	NONE	34			25			110			410		
Mercury (Total)	mg/kg	310	0.1	NONE	0.086		J+	0.05	J	U	0.069		J+	0.062		J+
Nickel (Total)	mg/kg	20,000	13.6	130	26			34			30			24		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.53		J-	0.39		J-	0.45			0.74		
Silver (Total)	mg/kg	5,100	4.04	34	0.14			0.1			0.17			0.29		
Thallium (Total)	mg/kg	67	0.0569	NONE	0.37			0.25			0.18			0.14		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	23			24			20			15		
Zinc (Total)	mg/kg	100,000	6.62	12,000	83	B	J	100	B	J	1000			940		

J - The associated numerical value is an estimated quantity.
J+ - The associated numerical value is an estimated quantity, potentially biased high.
J- - The associated numerical value is an estimated quantity, potentially biased low.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.
Underlined text indicates that value exceeds the applicable Soil Screening Level.

TABLE 7
SURFACE WATER SAMPLES
AOI 5-1
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-1-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SW-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.0035			0.0017			0.0017		
Barium (Total)	mg/L	20	0.22	0.089			0.082			0.17		
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U	0.001	U	U	0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.00016	J	J	0.00013	J	J	0.0003		
Chromium (Total)	mg/L	1.0	0.086	0.0013		J+	0.0013		J+	0.0043		J+
Chromium, Hexavalent	mg/L	1.0	0.011	0.005	U	U	0.005	U	U	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.003			0.0025			0.0083		
Copper (Total)	mg/L	1.3	0.0093	0.0033		J+	0.0021		J+	0.0075		
Lead (Total)	mg/L	0.15	0.0064	0.016			0.0071			0.023		
Mercury (Total)	mg/L	0.000012	0.00091	<i>0.000048</i>	J	J	0.0002*	U	U	<i>0.000056</i>	J	J
Nickel (Total)	mg/L	4.6	0.052	0.0021			0.0014			0.0068		
Selenium (Total)	mg/L	11.0	0.005	0.001	U	U	0.001	U	U	0.001	U	U
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U	0.0002*	U	U	0.000079	J	J
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U	0.001	U	U	0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.001		J+	0.001	J	U	0.0043		
Zinc (Total)	mg/L	69.0	0.12	0.055	B	J	0.043	B	J+	0.14	B	J
Hardness as CaCO3	mg/L			64			78			110		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 8
SEDIMENT SAMPLES
AOI 5-1
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-1-SED-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SED-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-1-SED-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	6.2			1.9			1.1		
Arsenic (Total)	mg/kg	3.9	9.79	3.9			3			4		
Barium (Total)	mg/kg	54,000	NA	1600			780			230		
Beryllium (Total)	mg/kg	1,500	NA	0.51			0.44			0.89		
Cadmium (Total)	mg/kg	370	0.99	1.6			2			0.96		
Chromium (Total)	mg/kg	1,000,000	43.4	22		J	12		J+	24		J
Chromium, Hexavalent	mg/kg	300	NA	2.3	U	U	2.8	U	U	2.3	U	U
Cobalt (Total)	mg/kg	9,000	50	150			68			30		
Copper (Total)	mg/kg	31,000	31.6	42		J	20		J	34		J
Lead (Total)	mg/kg	4,000	35.8	1200			400			110		
Mercury (Total)	mg/kg	230	0.174	0.09			0.082			0.096		
Nickel (Total)	mg/kg	16,000	22.7	18			15			33		
Selenium (Total)	mg/kg	3,900	NA	1.2			0.84			0.93		
Silver (Total)	mg/kg	3,900	0.5	0.3			0.56			0.3		
Thallium (Total)	mg/kg	52	NA	0.12			0.11			0.31		
Vanadium (Total)	mg/kg	780	NA	17			13			19		
Zinc (Total)	mg/kg	230,000	121	810	B	J	450	B	J	490	B	J

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 9
SURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-3
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-3-CS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-CS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-CS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-CS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	2.7	mg/kg	310	0.142	0.67			0.81			0.65			1.4		
Arsenic (Total)	7.2	mg/kg	3.9	5.7	4.3		J-	2.8		J-	2.1		J-	6.6		J-
Barium (Total)	590	mg/kg	54,000	1.04	86			120			74			110		
Beryllium (Total)	0.97	mg/kg	1,500	1.06	0.71			0.78			0.53			0.68		
Cadmium (Total)	4	mg/kg	370	0.0022	0.31			0.24			0.17			0.29		
Chromium (Total)	23	mg/kg	1,000,000	0.4	17		J	23		J	7.6		J	16		J
Chromium, Hexavalent	6.8	mg/kg	300	NA	1.9	U	UJ	2.4	U	U	3		J	6.8		J
Cobalt (Total)	59	mg/kg	9,000	0.14	11		J	7.9		J	11		J	13		J
Copper (Total)	21	mg/kg	31,000	5.4	21		J-	13		J-	8.7		J-	16		J-
Lead (Total)	270	mg/kg	4,000	0.0537	40			25			33			34		
Mercury (Total)	0.044	mg/kg	230	0.1	0.027	J	J	0.023	J	J	0.029	J	J	0.044	J	J
Nickel (Total)	35	mg/kg	16,000	13.6	23		J	18		J	11		J	22		J
Selenium (Total)	0.6	mg/kg	3,900	0.0276	0.5		J-	0.37		J-	0.27		J-	0.48		J-
Silver (Total)	0.33	mg/kg	3,900	4.04	0.26			0.26			0.18			0.23		
Thallium (Total)	0.24	mg/kg	52	0.0569	0.15			0.14			0.11			0.24		
Vanadium (Total)	26	mg/kg	780	1.59	20		J	16		J	11		J	24		J
Zinc (Total)	590	mg/kg	230,000	6.62	90	B	J	79	B	J	110	B	J	300	B	J

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-3-CS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-CS-DUF	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-DS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	2.7	mg/kg	410	0.142	2.7			1.5			0.53		
Arsenic (Total)	7.2	mg/kg	1.6	5.7	3.5		J-	7.2		J-	2.5		J-
Barium (Total)	590	mg/kg	67,000	1.04	590			75			62		
Beryllium (Total)	0.97	mg/kg	1,900	1.06	0.51			0.97			0.55		
Cadmium (Total)	4	mg/kg	450	0.0022	4			0.2			0.11		
Chromium (Total)	23	mg/kg	100,000	0.4	12		J	20		J	9.6		J
Chromium, Hexavalent	6.8	mg/kg	64	NA	1.9	U	U	1.4	J	J	0.21	J	J
Cobalt (Total)	59	mg/kg	1,900	0.14	59		J	14		J	5.8		J
Copper (Total)	21	mg/kg	41,000	5.4	14		J-	21		J-	12		J-
Lead (Total)	270	mg/kg	800	0.0537	270			25			18		
Mercury (Total)	0.044	mg/kg	310	0.1	0.037	J	J	0.03	J	J	0.042	J	J
Nickel (Total)	35	mg/kg	20,000	13.6	11		J	35		J	11		J
Selenium (Total)	0.6	mg/kg	5,100	0.0276	0.6		J-	0.47		J-	0.12		J-
Silver (Total)	0.33	mg/kg	5,100	4.04	0.33			0.18			0.27		
Thallium (Total)	0.24	mg/kg	67	0.0569	0.14			0.17			0.15		
Vanadium (Total)	26	mg/kg	1,000	1.59	14		J	26		J	13		J
Zinc (Total)	590	mg/kg	100,000	6.62	590	B	J	290	B	J	31	B	J

Shading indicates the maximum concentration of each COPI.

J - The associated numerical value is an estimated quantity.

J- - The associated numerical value is an estimated quantity, potentially biased low.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 10
SUBSURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-3
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		5-3-TP-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.25	mg/kg	0.25		J+
Arsenic (Total)	0.62	mg/kg	0.62		J+
Barium (Total)	120	mg/kg	120		
Beryllium (Total)	0.79	mg/kg	0.79		
Cadmium (Total)	0.057	mg/kg	0.057		
Chromium (Total)	10	mg/kg	10		
Chromium, Hexavalent	ND	mg/kg	2.3	U	UU
Cobalt (Total)	6.4	mg/kg	6.4		
Copper (Total)	19	mg/kg	19		J
Lead (Total)	33	mg/kg	33		
Mercury (Total)	ND	mg/kg	0.05	J	U
Nickel (Total)	13	mg/kg	13		
Selenium (Total)	0.34	mg/kg	0.34		
Silver (Total)	0.091	mg/kg	0.091	J	J
Thallium (Total)	0.15	mg/kg	0.15		
Vanadium (Total)	16	mg/kg	16		
Zinc (Total)	35	mg/kg	35		

Shading indicates the maximum concentration of each CC

- J - The associated numerical value is an estimated quantity.
- J+ - The associated numerical value is an estimated quantity, potentially biased high.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is sample quantitation limit.
- UU - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

TABLE 11
SURFACE SOIL SAMPLES
AOI 5-3
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-3-SS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SS-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SS-Dup2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	2.6			1			2.2			2.5			0.62		
Arsenic (Total)	mg/kg	1.6	5.7	6.2			3.3			3.2			3.4			3.8		
Barium (Total)	mg/kg	67,000	1.04	160		J	190		J	880		J	1100		J	170		J
Beryllium (Total)	mg/kg	1,900	1.06	0.22			0.51			0.58			0.54			0.19		
Cadmium (Total)	mg/kg	450	0.0022	18			0.58			0.58			0.68			13		
Chromium (Total)	mg/kg	100,000	0.4	20			18			13			15			13		
Chromium, Hexavalent	mg/kg	64	NA	10	J	J	2.1	U	UJ	2.1	U	UJ	2.1	U	UJ	11	J	J
Cobalt (Total)	mg/kg	1,900	0.14	49			21			64			70			47		
Copper (Total)	mg/kg	41,000	5.4	27			61			20			22			21		
Lead (Total)	mg/kg	800	0.0537	160			240			280			260			120		
Mercury (Total)	mg/kg	310	0.1	0.11		U	0.05	J	U	0.05	J	U	0.04	J	U	0.069		U
Nickel (Total)	mg/kg	20,000	13.6	14			18			18			19			11		
Selenium (Total)	mg/kg	5,100	0.0276	1.2		J	0.41		J	0.55			0.52			1.1		J
Silver (Total)	mg/kg	5,100	4.04	0.18			0.11			0.18			0.19			0.15		
Thallium (Total)	mg/kg	67	0.0569	0.11			0.13			0.17			0.18			0.091	J	J
Vanadium (Total)	mg/kg	1,000	1.59	6.5			15			17			17			6.7		
Zinc (Total)	mg/kg	100,000	6.62	730			260			500			590			600		

J - The associated numerical value is an estimated quantity.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 12
SUBSURFACE SOIL SAMPLES
AOI 5-3
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-3-SB-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SB-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SB-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SB-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SB-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SB-3-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.71			0.61			0.44			0.34			0.25		J+	0.39		J+
Arsenic (Total)	mg/kg	1.6	5.7	29	3.6		J	4.2		J	3.5		J	1.9		J	0.59		J+	0.99		J+
Barium (Total)	mg/kg	67,000	1.04	1,600	66			88			55			53			31			32		
Beryllium (Total)	mg/kg	1,900	1.06	63	0.68			1.1			0.79			0.85			0.52			1		
Cadmium (Total)	mg/kg	450	0.0022	8	0.35			0.15			0.17			0.1			0.047	J	J	0.078		
Chromium (Total)	mg/kg	100,000	0.4	38	18		J	22		J	20		J	23		J	10		J+	21		
Chromium, Hexavalent	mg/kg	64	NA	38	2	U		2	U		1.7	U		1.9	U		0.63	J	J	1.9	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	NONE	14		J	20		J	18		J	29		J	7.7			16		
Copper (Total)	mg/kg	41,000	5.4	NONE	20		J	24		J	29		J	30		J	26		J	26		J
Lead (Total)	mg/kg	800	0.0537	NONE	25			27			18			18			10			17		
Mercury (Total)	mg/kg	310	0.1	NONE	0.044	J		0.067			0.036	J		0.034	J		0.05	J	U	0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	130	27		J	36		J	31		J	45		J	14			28		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.45			0.37			0.53			0.35			0.27		J-	0.28		J-
Silver (Total)	mg/kg	5,100	4.04	34	0.12			0.16			0.15			0.1			0.13			0.11		
Thallium (Total)	mg/kg	67	0.0569	NONE	0.21			0.32			0.29			0.24			0.17			0.18		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	18		J	23		J	21		J	22		J	12			20		
Zinc (Total)	mg/kg	100,000	6.62	12,000	66			69			72			89			36	B	J	73	B	J

J - The associated numerical value is an estimated quantity.
J+ - The associated numerical value is an estimated quantity, potentially biased high.
J- - The associated numerical value is an estimated quantity, potentially biased low.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.
Underlined text indicates that value exceeds the applicable Soil Screening Level.

TABLE 13
SURFACE WATER SAMPLES
AOI 5-3
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-3-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SW-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.0021			0.00057	J	J	0.00066	J	J
Barium (Total)	mg/L	20	0.22	0.11			0.031			0.022		
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U	0.001	U	U	0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.00011	J	J	0.0002	U	U	0.0002	U	U
Chromium (Total)	mg/L	1.0	0.086	0.0059		J+	0.0013		J+	0.001	J	U
Chromium, Hexavalent	mg/L	1.0	0.011	0.005	U	U	0.005	U	U	0.0009	J	J
Cobalt (Total)	mg/L	NA	0.024	0.0041			0.00045	J	J	0.0004	J	J
Copper (Total)	mg/L	1.3	0.0093	0.0055			0.0014		J+	0.001		J+
Lead (Total)	mg/L	0.15	0.0064	0.0064		J+	0.001	J	U	0.001	J	U
Mercury (Total)	mg/L	0.000012	0.00091	0.0002*	U	U	0.000056	J	J	0.0002*	U	U
Nickel (Total)	mg/L	4.6	0.052	0.015			0.0026			0.0014		
Selenium (Total)	mg/L	11.0	0.005	0.001	U	U	0.001	U	U	0.001	U	U
Silver (Total)	mg/L	1.0	0.00012	0.00015	J	J	0.0002*	U	U	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U	0.001	U	U	0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.0095			0.0013		J+	0.0013		J+
Zinc (Total)	mg/L	69.0	0.12	0.049	B	J	0.026	B	J+	0.0099	B	J+
Hardness as CaCO3	mg/L			60			70			92		

		Human Health Target Decision Level	Ecological Target Decision Level	5-3-SW-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SW-Dup- 1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SW-Dup- 2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.00072	J	J	0.00077	J	J	0.00057	J	J
Barium (Total)	mg/L	20	0.22	0.029			0.028			0.027		
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U	0.001	U	U	0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.000065	J	J	0.0002	U	U	0.0002	U	U
Chromium (Total)	mg/L	1.0	0.086	0.001	J	U	0.0015		J+	0.001	U	U
Chromium, Hexavalent	mg/L	1.0	0.011	0.005	U	U	0.005	U	U	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.00057	J	J	0.00076	J	J	0.00033	J	J
Copper (Total)	mg/L	1.3	0.0093	0.0015		J+	0.0017		J+	0.0013		J+
Lead (Total)	mg/L	0.15	0.0064	0.0012		J+	0.0019		J+	0.001	J	U
Mercury (Total)	mg/L	0.000012	0.00091	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U
Nickel (Total)	mg/L	4.6	0.052	0.0019			0.0021			0.0015		
Selenium (Total)	mg/L	11.0	0.005	0.001	U	U	0.001	U	U	0.001	U	U
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U	0.001	U	U	0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.0015		J+	0.0016		J+	0.0011		J+
Zinc (Total)	mg/L	69.0	0.12	0.016	B	J+	0.015	B	J+	0.01	B	J+
Hardness as CaCO3	mg/L			92			90			80		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 14
SEDIMENT SAMPLES
AOI 5-3
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-3-SED-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SED-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SED-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SED-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SED-Dup-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-3-SED-Dup-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	0.39		J+	0.29		J+	0.5		J+	0.36		J+	0.55		J+	0.23		J+
Arsenic (Total)	mg/kg	3.9	9.79	6.4			3.4			3.2			1.3			3.2			2.8		
Barium (Total)	mg/kg	54,000	NA	160			140			110			64			110			110		
Beryllium (Total)	mg/kg	1,500	NA	1			0.97			0.61			0.37			0.66			0.75		
Cadmium (Total)	mg/kg	370	0.99	0.22			0.37			0.35			0.43			0.34			0.28		
Chromium (Total)	mg/kg	1,000,000	43.4	13		J	14		J+	14		J+	8.1		J+	13		J+	11		J
Chromium, Hexavalent	mg/kg	300	NA	2.5	U	U	0.28	J	J	2.6	U	U	1.8	U	U	2.5	U	U	4	U	U
Cobalt (Total)	mg/kg	9,000	50	13			7.5			10			4.6			11			5.6		
Copper (Total)	mg/kg	31,000	31.6	13		J	15		J	14		J	11		J	14		J	11		J
Lead (Total)	mg/kg	4,000	35.8	24			31			77			33			79			26		
Mercury (Total)	mg/kg	230	0.174	0.05	J	U	0.071			0.077			0.061		J+	0.079			0.062		J+
Nickel (Total)	mg/kg	16,000	22.7	31			21			16			12			15			16		
Selenium (Total)	mg/kg	3,900	NA	0.68			0.9			0.69			0.65			0.67			0.73		
Silver (Total)	mg/kg	3,900	0.5	0.14			0.11			0.098	J	J	0.12			0.093	J	J	0.074	J	J
Thallium (Total)	mg/kg	52	NA	0.16			0.19			0.22			0.12			0.22			0.13		
Vanadium (Total)	mg/kg	780	NA	21			20			20			12			20			14		
Zinc (Total)	mg/kg	230,000	121	170	B	J	93	B	J	100	B	J	91	B	J	95	B	J	76	B	J

J - The associated numerical value is an estimated quantity.
J+ - The associated numerical value is an estimated quantity, potentially biased high.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 15
SURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-4
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-4-CS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-6	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-7	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.63	mg/kg	410	0.142	0.28			0.2			0.2			0.3		J	0.2			0.12			0.34		
Arsenic (Total)	4.7	mg/kg	1.6	5.7	1.2		UJ	0.57			0.52			0.86		J-	1.1		UJ	1.6			2		
Barium (Total)	1500	mg/kg	67,000	1.04	170			170			130			150	B	J	600			480			150		
Beryllium (Total)	1	mg/kg	1,900	1.06	0.84			1			0.76			0.76			0.58			0.44			0.85		
Cadmium (Total)	3.9	mg/kg	450	0.0022	0.12			0.074			0.079			0.1			0.14			0.057			0.37		
Chromium (Total)	24	mg/kg	100,000	0.4	20			20		J	20		J	17		J-	13			10		J	24		J
Chromium, Hexavalent	1.6	mg/kg	64	NA	37	U	U	1.9	U	R	22	U	R	1.6	U	UJ	1.7	U	U	2	U	R	14	U	R
Cobalt (Total)	33	mg/kg	1,900	0.14	22			21		J	21		J	32		J-	13			7.9		J	16		J
Copper (Total)	26	mg/kg	41,000	5.4	23			24		J	26		J	21		J-	13			11		J	24		J
Lead (Total)	970	mg/kg	800	0.0537	22		J	13			17			22			29		J	15			110		
Mercury (Total)	0.14	mg/kg	310	0.1	0.017	J	J	0.016	J	J	0.018	J	J	0.015	J	J	0.0074	J	J	0.0064	J	J	0.14		
Nickel (Total)	38	mg/kg	20,000	13.6	35			38		J	33		J	26		J-	20			14		J	27		J
Selenium (Total)	0.69	mg/kg	5,100	0.0276	0.1		J-	0.24		J-	0.38		J-	0.36		J-	0.1	U	UJ	0.1	U	UJ	0.29		J-
Silver (Total)	1.4	mg/kg	5,100	4.04	0.34			0.28			0.31			0.71			0.39			0.24			0.52		
Thallium (Total)	0.18	mg/kg	67	0.0569	0.16			0.18			0.17			0.16		J	0.15			0.11			0.12		
Vanadium (Total)	23	mg/kg	1,000	1.59	20			21		J	19		J	17		J	13			11		J	22		J
Zinc (Total)	1300	mg/kg	100,000	6.62	170	B	J	100	B	J	120	B	J	230	B	J	330	B	J	130	B	J	370	B	J

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-4-CS-8	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-9	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-10	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-11	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-12	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-13	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-14	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.63	mg/kg	410	0.142	0.38			0.12			0.3			0.57			0.42			0.6			1.5		
Arsenic (Total)	4.7	mg/kg	1.6	5.7	1.4		J	4.7		J	2.6			4.3		J	2.9		J	3.2			3.3		
Barium (Total)	1500	mg/kg	67,000	1.04	120			380			840			400			100			600			1200		
Beryllium (Total)	1	mg/kg	1,900	1.06	0.75			0.65			0.4			0.36			0.93			0.56			0.45		
Cadmium (Total)	3.9	mg/kg	450	0.0022	0.13			0.21			0.13			3.9			0.13			1.8			0.63		
Chromium (Total)	24	mg/kg	100,000	0.4	21			18			10		J	8.4			21			19		J	10		J
Chromium, Hexavalent	1.6	mg/kg	64	NA	2.1	U	U	1.8	U	U	15	U	R	1.9	U	U	2.1	U	U	2.2	U	R	20	U	R
Cobalt (Total)	33	mg/kg	1,900	0.14	18			14			5.9		J	9.7			21			15		J	31		J
Copper (Total)	26	mg/kg	41,000	5.4	25			20			9.2		J	9.3			26			23		J	25		J
Lead (Total)	970	mg/kg	800	0.0537	19		J	50		J	27			190		J	20		J	330			970		
Mercury (Total)	0.14	mg/kg	310	0.1	0.026	J	J	0.019	J	J	0.0071	J	J	0.015		J	0.019	J	J	0.016	J	J	0.027	J	J
Nickel (Total)	38	mg/kg	20,000	13.6	27			24			11		J	8.9			35			23		J	13		J
Selenium (Total)	0.69	mg/kg	5,100	0.0276	0.15		J-	0.16		J-	0.1	U	UJ	0.48		J-	0.23		J-	0.28		J-	0.69		J-
Silver (Total)	1.4	mg/kg	5,100	4.04	0.37			0.39			0.6			1.2			0.28			1.4			1.4		
Thallium (Total)	0.18	mg/kg	67	0.0569	0.14			0.13			0.086	J	J	0.14			0.17			0.12			0.089	J	J
Vanadium (Total)	23	mg/kg	1,000	1.59	22			19			13		J	14			23			23		J	16		J
Zinc (Total)	1300	mg/kg	100,000	6.62	310	B	J	470	B	J	340	B	J	910	B	J	110	B	J	970	B	J	1300	B	J

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-4-CS-15	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-CS-DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-DS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-DS-6	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.63	mg/kg	410	0.142	0.63			0.12			0.3			0.12			0.066	J	J
Arsenic (Total)	4.7	mg/kg	1.6	5.7	1.5		J	1.9			1.1		UJ	3.6		J	3.2		
Barium (Total)	1500	mg/kg	67,000	1.04	220			590			150			1500			900		
Beryllium (Total)	1	mg/kg	1,900	1.06	0.54			0.32			0.68			0.049	J	J	0.034	J	J
Cadmium (Total)	3.9	mg/kg	450	0.0022	0.53			0.041	J	J	0.08			0.13			0.013	J	J
Chromium (Total)	24	mg/kg	100,000	0.4	12			7.9		J	17			2.5			2.1		J
Chromium, Hexavalent	1.6	mg/kg	64	NA	45	U	U	0.15	J	J	16	U	U	1.8	U	U	2.3	U	R
Cobalt (Total)	33	mg/kg	1,900	0.14	9			7.1		J	33			0.7			0.57		J
Copper (Total)	26	mg/kg	41,000	5.4	13			8.5		J	23			1.9			0.9		J
Lead (Total)	970	mg/kg	800	0.0537	450		J	2			21		J	29		J	1.4		
Mercury (Total)	0.14	mg/kg	310	0.1	0.042	J	J	0.05	U	U	0.024	J	J	0.05	U	U	0.05	U	U
Nickel (Total)	38	mg/kg	20,000	13.6	15			12		J	27			1.3			0.94		J
Selenium (Total)	0.69	mg/kg	5,100	0.0276	0.4		J-	0.079	J	J-	0.15		J-	0.16		J-	0.12		J-
Silver (Total)	1.4	mg/kg	5,100	4.04	0.77			0.18			0.31			0.32			0.1		
Thallium (Total)	0.18	mg/kg	67	0.0569	0.12			0.096	J	J	0.14			0.049	J	J	0.035	J	J
Vanadium (Total)	23	mg/kg	1,000	1.59	12			9.6		J	17			7.3			6.5		J
Zinc (Total)	1300	mg/kg	100,000	6.62	1200	B	J	100	B	J	210	B	J	350	B	J	26	B	J+

Shading indicates the maximum concentration of each COPI.

- J - The associated numerical value is an estimated quantity.
- J+ - The associated numerical value is an estimated quantity, potentially biased high.
- J- - The associated numerical value is an estimated quantity, potentially biased low.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
- B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 16
SUBSURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-4
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		5-4-SB-4- Comp	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-TP-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-TP-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-TP-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.48	mg/kg	0.24			0.26		J+	0.48			0.3		J+
Arsenic (Total)	8.8	mg/kg	1.3		J	2.9			8.8			1		
Barium (Total)	1100	mg/kg	280		J	190			210			1100		
Beryllium (Total)	0.88	mg/kg	0.28		J	0.52			0.88			0.76		
Cadmium (Total)	2.7	mg/kg	0.1			1.1			2.7			0.44		
Chromium (Total)	21	mg/kg	11			15			21			12		
Chromium, Hexavalent	0.45	mg/kg	0.45	J	J	1.7	U	U	1.6	U	U	1.9	U	U
Cobalt (Total)	13	mg/kg	3.4		J	7		J+	13		J+	3.7		J+
Copper (Total)	24	mg/kg	8		J	24		J	23		J	20		J
Lead (Total)	1500	mg/kg	63			480			1500			31		
Mercury (Total)	0.063	mg/kg	0.055			0.063			0.05	J	U	0.05	J	U
Nickel (Total)	25	mg/kg	8.9		J	16			25			13		
Selenium (Total)	1.3	mg/kg	0.079	J	J	0.57			1.3			1.1		
Silver (Total)	0.37	mg/kg	0.14			0.37			0.31			0.19		
Thallium (Total)	0.17	mg/kg	0.1			0.12			0.17			0.11		
Vanadium (Total)	25	mg/kg	15		J	21			25			18		
Zinc (Total)	2500	mg/kg	110			340			320			2500		

Shading indicates the maximum concentration of eac

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

TABLE 17
SURFACE SOIL SAMPLES
AOI 5-4
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-4-SS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SS-6	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	0.7			0.45			0.3			0.7			0.7			0.61		
Arsenic (Total)	mg/kg	1.6	5.7	15			1.6			1.7			2.7			4.4			3.7		
Barium (Total)	mg/kg	67,000	1.04	46		J	260		J	86		J	1000		J	450		J	190		J
Beryllium (Total)	mg/kg	1,900	1.06	0.68			0.61			0.79			0.54			0.59			0.4		
Cadmium (Total)	mg/kg	450	0.0022	0.19			0.59			0.089			0.078			0.76			0.5		
Chromium (Total)	mg/kg	100,000	0.4	22			16			19			8.1			19			12		
Chromium, Hexavalent	mg/kg	64	NA	1.8	U	UJ	2	J	UJ	0.39	J	J	8.4		J	2.2	U	UJ	2.8	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	13			13			17			5.7			34			9.8		
Copper (Total)	mg/kg	41,000	5.4	25			21			23			15			28			15		
Lead (Total)	mg/kg	800	0.0537	37			180			13			20			730			150		
Mercury (Total)	mg/kg	310	0.1	0.05	J	U	0.05	J	U	0.05	J	U	0.05	J	U	0.38			0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	25			21			24			16			25			14		
Selenium (Total)	mg/kg	5,100	0.0276	0.5			0.33			0.37			1.1			0.73			0.62		
Silver (Total)	mg/kg	5,100	4.04	0.15			0.26			0.078	J	J	0.14			0.2			0.26		
Thallium (Total)	mg/kg	67	0.0569	0.14			0.11			0.15			0.11			0.14			0.11		
Vanadium (Total)	mg/kg	1,000	1.59	22			18			22			11			19			17		
Zinc (Total)	mg/kg	100,000	6.62	130			860			72			210			950			890		

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 18
SUBSURFACE SOIL SAMPLES
AOI 5-4
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-4-SB-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SB-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SB-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SB-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SB-2-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SB-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.91			0.51			0.24		J+	0.33		J+	0.28		J+	0.47		J+
Arsenic (Total)	mg/kg	1.6	5.7	29	6.7		J	3.7		J	5.5			2			3.2			5.7		
Barium (Total)	mg/kg	67,000	1.04	1,600	140		J	22		J	110			85			87			310		
Beryllium (Total)	mg/kg	1,900	1.06	63	0.97		J	0.23		J	0.94			0.56			0.7			0.94		
Cadmium (Total)	mg/kg	450	0.0022	8	0.3			0.05	U		0.16			0.12			0.13			0.091		
Chromium (Total)	mg/kg	100,000	0.4	38	17			3.1		J+	25			21			23			23		
Chromium, Hexavalent	mg/kg	64	NA	38	1.8	U		1.9	U		0.13	J	J	0.66	J	J	0.28	J	J	0.18	J	J
Cobalt (Total)	mg/kg	1,900	0.14	NONE	14		J	0.35		J	18			12			14			16		
Copper (Total)	mg/kg	41,000	5.4	NONE	25		J	8.8		J	27		J	20		J	22		J	28		J
Lead (Total)	mg/kg	800	0.0537	NONE	34			28			18			14			17			26		
Mercury (Total)	mg/kg	310	0.1	NONE	0.065			0.13			0.05	J	U	0.07		J+	0.05	J	U	0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	130	31		J	1.3		J	30			22			25			28		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.97		J	1.8		J	0.3		J-	0.34		J-	0.29		J-	0.53		J-
Silver (Total)	mg/kg	5,100	4.04	34	0.14			0.19			0.12			0.11			0.13			0.064	J	
Thallium (Total)	mg/kg	67	0.0569	NONE	0.27			0.27			0.14			0.11			0.12			0.14		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	20		J	5.2		J	25			23			25			25		
Zinc (Total)	mg/kg	100,000	6.62	12,000	140			4.4		J+	110	B	J	150	B	J	130	B	J	110	B	J+

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-4-SB-3-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SB-4-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SB-4-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-TP-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-TP-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-TP-4-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.34		J+	0.35			0.34			0.29		J+	0.22		J+	0.17		J+
Arsenic (Total)	mg/kg	1.6	5.7	29	1.4			6.4		J	4.2		J	7.2			1.9			0.85		
Barium (Total)	mg/kg	67,000	1.04	1,600	190			35		J	54		J	170			170			130		
Beryllium (Total)	mg/kg	1,900	1.06	63	0.77			0.79		J	0.82		J	1.1			0.97			1.1		
Cadmium (Total)	mg/kg	450	0.0022	8	0.12			0.17			0.13			0.2			0.21			0.2		
Chromium (Total)	mg/kg	100,000	0.4	38	18			24			24			26			27			24		
Chromium, Hexavalent	mg/kg	64	NA	38	0.25	J	J	1.5	U		1.7	U		1.9	U	U	1.8	U	U	1.6	U	U
Cobalt (Total)	mg/kg	1,900	0.14	NONE	22			16		J	17		J	16		J+	16		J+	24		J+
Copper (Total)	mg/kg	41,000	5.4	NONE	28		J	29		J	26		J	27		J	26		J	27		J
Lead (Total)	mg/kg	800	0.0537	NONE	23			17			16			31			22			99		
Mercury (Total)	mg/kg	310	0.1	NONE	0.05	J	U	0.05	J	U	0.05	J	U	0.05	J	U	0.05	J	U	0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	130	37			31		J	33		J	30			30			40		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.55		J-	0.58		J	0.4		J	0.5			0.27			0.25		
Silver (Total)	mg/kg	5,100	4.04	34	0.069	J		0.13			0.1			0.25			0.17			0.1		
Thallium (Total)	mg/kg	67	0.0569	NONE	0.15			0.14			0.14			0.17			0.14			0.16		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	16			23		J	22		J	27			25			25		
Zinc (Total)	mg/kg	100,000	6.62	12,000	92	B	J	120			100			170			130		J+	1400		

J - The associated numerical value is an estimated quantity.
J+ - The associated numerical value is an estimated quantity, potentially biased high.
J- - The associated numerical value is an estimated quantity, potentially biased low.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.
Underlined text indicates that value exceeds the applicable Soil Screening Level.

TABLE 19
SURFACE WATER SAMPLES
AOI 5-4
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-4-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SW-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SW-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SW-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.00067	J	J	0.00059	J	J	0.00057	J	J	0.00085	J	J	0.00066	J	J
Barium (Total)	mg/L	20	0.22	0.04			0.036			0.039			0.042			0.036		
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U	0.00051	J	J	0.00045	J	J	0.00084	J	J	0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.0001	J	J	0.00026			0.00026			0.0003			0.00019	J	J
Chromium (Total)	mg/L	1.0	0.086	0.001	U	U	0.00071	J	J	0.001	U	U	0.001	U	U	0.001	U	U
Chromium, Hexavalent	mg/L	1.0	0.011	0.005	U	U	0.005	U	U	0.005	U	U	0.005	U	U	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.00073	J	J	0.022			0.023			0.029			0.0024		
Copper (Total)	mg/L	1.3	0.0093	0.00073	J	J	0.0012			0.002			0.0023			0.0013		
Lead (Total)	mg/L	0.15	0.0064	0.0024			0.00036	J	J	0.00086	J	J	0.0014			0.00054	J	J
Mercury (Total)	mg/L	0.000012	0.00091	0.0002*	U	UJ	0.0002*	U	UJ	0.0002*	U	UJ	0.0002*	U	UJ	0.0002*	U	UJ
Nickel (Total)	mg/L	4.6	0.052	0.0065		R	0.086		R	0.086		R	0.095		R	0.042		R
Selenium (Total)	mg/L	11.0	0.005	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.0014			0.00054	J	J	0.0016			0.001			0.0013		
Zinc (Total)	mg/L	69.0	0.12	0.049	B	J	0.11	B	J	0.099	B	J	0.12	B	J	0.048	B	J
Hardness as CaCO3	mg/L			180			150			170			8			130		

- J - The associated numerical value is an estimated quantity.
R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.
*Laboratory detection limit exceeds Target Decision Level.

TABLE 20
SEDIMENT SAMPLES
AOI 5-4
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-4-SED-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SED-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SED-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-4-SED-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	0.51			0.33			0.51			0.57		
Arsenic (Total)	mg/kg	3.9	9.79	8.7			1.5			5.4			7.7		
Barium (Total)	mg/kg	54,000	NA	82		J	71		J	110		J	140		J
Beryllium (Total)	mg/kg	1,500	NA	1.1			0.92			0.89			1.5		
Cadmium (Total)	mg/kg	370	0.99	0.3			0.13			0.48			0.3		
Chromium (Total)	mg/kg	1,000,000	43.4	18			21			16			14		
Chromium, Hexavalent	mg/kg	300	NA	1.4	J	UJ	0.77	U	UJ	3	J	UJ	3.4		J
Cobalt (Total)	mg/kg	9,000	50	22			23			20			18		
Copper (Total)	mg/kg	31,000	31.6	22			26			12			13		
Lead (Total)	mg/kg	4,000	35.8	27			15			70			22		
Mercury (Total)	mg/kg	230	0.174	0.053		U	0.05	J	U	0.067		U	0.05	J	U
Nickel (Total)	mg/kg	16,000	22.7	59			38			32			45		
Selenium (Total)	mg/kg	3,900	NA	0.59		J	0.32		J	0.65		J	0.71		J
Silver (Total)	mg/kg	3,900	0.5	0.12			0.079	J	J	0.1			0.09	J	J
Thallium (Total)	mg/kg	52	NA	0.19			0.18			0.26			0.23		
Vanadium (Total)	mg/kg	780	NA	20			23			21			23		
Zinc (Total)	mg/kg	230,000	121	160			110			130			120		

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 21
SURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-5
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-5-CS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-CS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-CS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-CS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-CS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	4.8	mg/kg	410	0.142	3.6			1.8			1.3			1.4			1.7		
Arsenic (Total)	15	mg/kg	1.6	5.7	13		J	3		J-	1.5		J-	1.1		UJ	0.98		UJ
Barium (Total)	480	mg/kg	67,000	1.04	400			120			90			70			72		
Beryllium (Total)	0.68	mg/kg	1,900	1.06	0.67			0.66			0.35			0.31			0.5		
Cadmium (Total)	7.2	mg/kg	450	0.0022	0.81			0.64			0.8			1.1			7.2		
Chromium (Total)	29	mg/kg	100,000	0.4	27			14		J	9.7		J	7.4		J	9.4		J
Chromium, Hexavalent	3.7	mg/kg	64	NA	31	U	U	2	J	J	2.8		J	3.7		J	1.6	U	UJ
Cobalt (Total)	23	mg/kg	1,900	0.14	12			10		J	8.9		J	13		J	14		J
Copper (Total)	27	mg/kg	41,000	5.4	20			15		J-	14		J-	11		J-	27		J-
Lead (Total)	6200	mg/kg	800	0.0537	910		J	6200			340			170			1100		
Mercury (Total)	0.11	mg/kg	310	0.1	0.093			0.026	J	J	0.025	J	J	0.016	J	J	0.058		
Nickel (Total)	26	mg/kg	20,000	13.6	21			15		J	14		J	26		J	13		J
Selenium (Total)	1.3	mg/kg	5,100	0.0276	1.1		J-	0.61		J-	0.54		J-	0.75		J-	1.1		J-
Silver (Total)	1.7	mg/kg	5,100	4.04	1.4			0.75			0.27			0.19			0.31		
Thallium (Total)	0.19	mg/kg	67	0.0569	0.19			0.11			0.09	J	J	0.078	J	J	0.087	J	J
Vanadium (Total)	52	mg/kg	1,000	1.59	44			16		J	13		J	11		J	12		J
Zinc (Total)	6600	mg/kg	100,000	6.62	2700	B	J	2800	B	J	670	B	J	960	B	J	990	B	J

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-5-CS-6	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-CS-7	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-CS-DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-DS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-DS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	4.8	mg/kg	410	0.142	2.5			1.2			4.8			1.2			3.1		
Arsenic (Total)	15	mg/kg	1.6	5.7	2.5		J-	1		UJ	15		J	1.7		J-	0.65		UJ
Barium (Total)	480	mg/kg	67,000	1.04	110			77			480			220			75		
Beryllium (Total)	0.68	mg/kg	1,900	1.06	0.54			0.34			0.68			0.39			0.45		
Cadmium (Total)	7.2	mg/kg	450	0.0022	0.3			2.1			0.94			0.93			0.69		
Chromium (Total)	29	mg/kg	100,000	0.4	9.1		J	6.1		J	29			11		J	6.5		J
Chromium, Hexavalent	3.7	mg/kg	64	NA	0.91	J	J	1.8		J	34	U	U	1.7	U	UJ	0.34	J	J
Cobalt (Total)	23	mg/kg	1,900	0.14	8.1		J	15		J	12			23		J	11		J
Copper (Total)	27	mg/kg	41,000	5.4	11		J-	11		J-	19			11		J-	19		J-
Lead (Total)	6200	mg/kg	800	0.0537	180			630			920		J	500			1500		
Mercury (Total)	0.11	mg/kg	310	0.1	0.033	J	J	0.024	J	J	0.11			0.045	J	J	0.13		
Nickel (Total)	26	mg/kg	20,000	13.6	11		J	19		J	22			8.9		J	8.2		J
Selenium (Total)	1.3	mg/kg	5,100	0.0276	0.41		J-	0.91		J-	1.3		J-	0.58		J-	0.61		J-
Silver (Total)	1.7	mg/kg	5,100	4.04	0.2			0.25			1.7			0.81			0.34		
Thallium (Total)	0.19	mg/kg	67	0.0569	0.13			0.066	J	J	0.19			0.086	J	J	0.078	J	J
Vanadium (Total)	52	mg/kg	1,000	1.59	15		J	9.7		J	52			16		J	9.5		J
Zinc (Total)	6600	mg/kg	100,000	6.62	200	B	J	2700	B	J	4600	B	J	6600	B	J	1000	B	J

Shading indicates the maximum concentration of each COPI.

J - The associated numerical value is an estimated quantity.

J- - The associated numerical value is an estimated quantity, potentially biased low.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 22
SUBSURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-5
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		5-5-TP-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-TP-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-TP-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-TP-2-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-TP-2-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-TP-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	4.5	mg/kg	0.82			0.45			4.5			0.28			0.71			2.3		
Arsenic (Total)	5	mg/kg	2.6			3.1			2.4			1.3			3.2			5		
Barium (Total)	2300	mg/kg	280		J	550		J	2300		J	560		J	790		J	320		J
Beryllium (Total)	0.88	mg/kg	0.48			0.88			0.61			0.27			0.8			0.52		
Cadmium (Total)	1.1	mg/kg	0.2			0.19			1.1			0.26			0.2			0.24		
Chromium (Total)	19	mg/kg	16			19			11			9.6			18			19		
Chromium, Hexavalent	5.3	mg/kg	5.3			1.6	U	U	2.8		J	1.7	U	U	1.9	U	U	0.38	J	J
Cobalt (Total)	170	mg/kg	21		J+	50		J+	170			130			66			58		J+
Copper (Total)	19	mg/kg	9.3		J	19		J	16		J	5.7		J	19		J	15		J
Lead (Total)	170	mg/kg	43			24			24			20			28			170		
Mercury (Total)	0.075	mg/kg	0.044	J	J	0.072			0.029	J	J	0.04	J	J	0.075			0.044	J	J
Nickel (Total)	23	mg/kg	13			23			13			4.1			21			22		
Selenium (Total)	1	mg/kg	0.22			0.45			0.39			0.14			0.4			1		
Silver (Total)	0.25	mg/kg	0.18			0.25			0.12			0.12			0.25			0.21		
Thallium (Total)	0.28	mg/kg	0.086	J	J	0.28			0.13			0.083	J	J	0.24			0.16		
Vanadium (Total)	30	mg/kg	17			21			13			18			20			30		
Zinc (Total)	2400	mg/kg	600			270	B		2400	B		680	B		370	B		1400	B	

Shading indicates the maximum concentration of each

- J - The associated numerical value is an estimated quantity.
- J+ - The associated numerical value is an estimated quantity, potentially biased high.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

TABLE 23
SURFACE SOIL SAMPLES
AOI 5-5
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-5-SS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-SS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-SS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	0.28			0.36			0.53		
Arsenic (Total)	mg/kg	1.6	5.7	1.1			2.7			5.3		
Barium (Total)	mg/kg	67,000	1.04	65		J	79		J	77		J
Beryllium (Total)	mg/kg	1,900	1.06	0.52			0.72			0.8		
Cadmium (Total)	mg/kg	450	0.0022	0.13			0.21			0.16		
Chromium (Total)	mg/kg	100,000	0.4	16			18			18		
Chromium, Hexavalent	mg/kg	64	NA	2.3	U	UJ	1.8	U	UJ	1.8	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	11			17			17		
Copper (Total)	mg/kg	41,000	5.4	18			20			24		
Lead (Total)	mg/kg	800	0.0537	17			25			23		
Mercury (Total)	mg/kg	310	0.1	0.05	J	U	0.05	J	U	0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	19			27			30		
Selenium (Total)	mg/kg	5,100	0.0276	0.31			0.33			0.65		
Silver (Total)	mg/kg	5,100	4.04	0.079	J	J	0.1			0.12		
Thallium (Total)	mg/kg	67	0.0569	0.12			0.14			0.17		
Vanadium (Total)	mg/kg	1,000	1.59	18			16			17		
Zinc (Total)	mg/kg	100,000	6.62	82			120			100		

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 24
SUBSURFACE SOIL SAMPLES
AOI 5-5
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-5-SB-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-SB-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-SB-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-SB-3-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-TP-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-TP-3-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.34			0.66			0.28			0.4			0.5			0.44		
Arsenic (Total)	mg/kg	1.6	5.7	29	3.8		J	13		J	6.8		J	6		J	7.3			7.1		
Barium (Total)	mg/kg	67,000	1.04	1,600	140			74			68			80			240		J	240		
Beryllium (Total)	mg/kg	1,900	1.06	63	1.3			1.1			0.78			0.86			1.2			1.2		
Cadmium (Total)	mg/kg	450	0.0022	8	1			0.22			0.15			0.16			0.12			0.1		
Chromium (Total)	mg/kg	100,000	0.4	38	26		J	26		J	17		J	19		J	27			15		
Chromium, Hexavalent	mg/kg	64	NA	38	1.7	U		1.7	U		1.4	U		0.22	J		1.8	U	U	2.3	U	U
Cobalt (Total)	mg/kg	1,900	0.14	NONE	32		J	20		J	11		J	12		J	23		J+	18		J+
Copper (Total)	mg/kg	41,000	5.4	NONE	32		J	28		J	21		J	22		J	28		J	20		J
Lead (Total)	mg/kg	800	0.0537	NONE	37			20			30			26			20			24		
Mercury (Total)	mg/kg	310	0.1	NONE	0.029	J		0.024	J		0.14			0.16			0.05	J	U	0.056		J+
Nickel (Total)	mg/kg	20,000	13.6	130	48		J	35		J	21		J	23		J	36			25		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.57			0.5			2			0.94			0.38			0.81		
Silver (Total)	mg/kg	5,100	4.04	34	0.079	J		0.12			0.2			0.18			0.11			0.15		
Thallium (Total)	mg/kg	67	0.0569	NONE	0.16			0.17			0.68			0.48			0.18			0.22		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	28		J	28		J	18		J	20		J	29			25		
Zinc (Total)	mg/kg	100,000	6.62	12,000	420			160			59			66			120	B	J+	74		J+

J - The associated numerical value is an estimated quantity.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.
Underlined text indicates that value exceeds the applicable Soil Screening Level.

TABLE 25
SURFACE WATER SAMPLES
AOI 5-5
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-5-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-SW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.017			0.066		
Barium (Total)	mg/L	20	0.22	0.21			0.66		
Beryllium (Total)	mg/L	0.28	0.0036	0.0039			0.0056		
Cadmium (Total)	mg/L	0.05	0.0025	0.00037			0.00056		
Chromium (Total)	mg/L	1.0	0.086	0.026		J+	0.095		
Chromium, Hexavalent	mg/L	1.0	0.011	0.005	U	U	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.082			0.096		
Copper (Total)	mg/L	1.3	0.0093	0.024			0.084		
Lead (Total)	mg/L	0.15	0.0064	0.043			0.17		
Mercury (Total)	mg/L	0.000012	0.00091	<i>0.00012</i>	J	J	<i>0.00039</i>		
Nickel (Total)	mg/L	4.6	0.052	0.17			0.24		
Selenium (Total)	mg/L	11.0	0.005	0.0014			0.0056		
Silver (Total)	mg/L	1.0	0.00012	0.00023			0.0011		
Thallium (Total)	mg/L	0.0063	0.01	0.00049	J	J	0.0016		
Vanadium (Total)	mg/L	NA	0.012	0.048			0.18		
Zinc (Total)	mg/L	69.0	0.12	0.2	B	J	0.47	B	J
Hardness as CaCO3	mg/L			10			170		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 26
SEDIMENT SAMPLES
AOI 5-5
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-5-SED-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-5-SED-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	0.8		J+	0.91		J+
Arsenic (Total)	mg/kg	3.9	9.79	12			13		
Barium (Total)	mg/kg	54,000	NA	75			78		
Beryllium (Total)	mg/kg	1,500	NA	0.73			1.1		
Cadmium (Total)	mg/kg	370	0.99	0.1			0.098		
Chromium (Total)	mg/kg	1,000,000	43.4	19			21		
Chromium, Hexavalent	mg/kg	300	NA	0.76	J	J	0.61	J	J
Cobalt (Total)	mg/kg	9,000	50	4.1			5.2		
Copper (Total)	mg/kg	31,000	31.6	27		J	29		J
Lead (Total)	mg/kg	4,000	35.8	49			63		
Mercury (Total)	mg/kg	230	0.174	0.13			0.16		
Nickel (Total)	mg/kg	16,000	22.7	15			19		
Selenium (Total)	mg/kg	3,900	NA	1.6			2.1		
Silver (Total)	mg/kg	3,900	0.5	0.2			0.24		
Thallium (Total)	mg/kg	52	NA	0.35			0.34		
Vanadium (Total)	mg/kg	780	NA	28			32		
Zinc (Total)	mg/kg	230,000	121	46			47		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 27
SEEP SAMPLES
AOI 5-5
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-5-SEEP-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.0008	J	J
Barium (Total)	mg/L	20	0.22	0.051		J-
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.00046		
Chromium (Total)	mg/L	1.0	0.086	0.00068	J	J
Chromium, Hexavalent-Dissolved	mg/L	1.0	0.011	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.0032		J-
Copper (Total)	mg/L	1.3	0.0093	0.0052		
Lead (Total)	mg/L	0.15	0.0064	0.0071		
Mercury (Total)	mg/L	0.00012	0.00091	0.0002*	U	U
Nickel (Total)	mg/L	4.6	0.052	0.0049		
Selenium (Total)	mg/L	11.0	0.005	0.001	U	U
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.0016		
Zinc (Total)	mg/L	69.0	0.12	0.098	B	J
1,1,1-Trichloroethane	mg/L	2	0.076	0.0010	U	UJ
1,1,2,2-Tetrachloroethane	mg/L	NA	0.38	0.0010	U	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	NA	NA	0.0010	U	UJ
1,1,2-Trichloroethane	mg/L	0.05	0.5	0.0010	U	UJ
1,1-Dichloroethane	mg/L	NA	0.047	0.0010	U	UJ
1,1-Dichloroethene	mg/L	0.07	0.065	0.0010	U	UJ
1,2,4-Trichlorobenzene	mg/L	0.7	0.03	0.0010	U	UJ
1,2-Dibromo-3-chloropropane	mg/L	0.002	NA	0.0010	U	UJ
1,2-Dibromoethane	mg/L	0.0005	NA	0.001*	U	UJ
1,2-Dichlorobenzene	mg/L	6	0.014	0.0010	U	UJ
1,2-Dichloroethane	mg/L	0.05	0.91	0.0010	U	UJ
1,2-Dichloropropane	mg/L	0.05	0.36	0.0010	U	UJ
1,3-Dichlorobenzene	mg/L	NA	0.038	0.0010	U	UJ
1,4-Dichlorobenzene	mg/L	0.75	0.0094	0.0010	U	UJ
2-Butanone (MEK)	mg/L	NA	2.2	0.0050	U	UJ
2-Hexanone	mg/L	NA	0.099	0.0050	U	UJ
4-Methyl-2-pentanone (MIBK)	mg/L	NA	0.17	0.0050	U	UJ
Acetone	mg/L	NA	1.7	0.0050	U	UJ
Benzene	mg/L	0.05	0.114	0.0010	U	UJ
Bromodichloromethane	mg/L	NA	NA	0.0010	U	UJ
Bromofom	mg/L	NA	0.23	0.0010	U	UJ
Bromomethane	mg/L	NA	0.016	0.0010	U	UJ
Carbon Disulfide	mg/L	NA	0.015	0.0050	J	UJ
Carbon tetrachloride	mg/L	NA	0.24	0.0010	U	UJ
Chlorobenzene	mg/L	1	0.047	0.0010	U	UJ
Chloroethane	mg/L	NA	NA	0.0010	U	UJ
Chloroform	mg/L	NA	0.14	0.0010	U	UJ
Chloromethane	mg/L	NA	NA	0.0010	U	UJ
cis-1,2-Dichloroethene	mg/L	0.7	NA	0.0010	U	UJ
cis-1,3-Dichloropropene	mg/L	NA	NA	0.0010	U	UJ
Cyclohexane	mg/L	NA	NA	0.0050	U	UJ
Dibromochloromethane	mg/L	NA	NA	0.0010	U	UJ
Dichlorodifluoromethane	mg/L	NA	NA	0.0010	U	UJ
Ethylbenzene	mg/L	7	0.014	0.0010	U	UJ
Isopropylbenzene (Cumene)	mg/L	NA	NA	0.0010	U	UJ
Methyl Acetate	mg/L	NA	NA	0.0050	U	UJ
Methyl tert-Butyl Ether (MTBE)	mg/L	NA	NA	0.0010	U	UJ
Methylcyclohexane	mg/L	NA	NA	0.0050	U	UJ
Methylene Chloride	mg/L	0.05	0.94	0.0010	J	UJ
Styrene	mg/L	1	0.032	0.0010	U	UJ
Tetrachloroethene	mg/L	0.05	0.045	0.0010	U	UJ
Toluene	mg/L	10	0.253	0.0010	U	UJ
trans-1,2-Dichloroethene	mg/L	1	0.97	0.0010	U	UJ
trans-1,3-Dichloropropene	mg/L	NA	NA	0.0010	U	UJ
Trichloroethene	mg/L	0.05	0.047	0.0010	U	UJ
Trichlorofluoromethane	mg/L	NA	NA	0.0010	U	UJ
Vinyl Chloride	mg/L	0.02	0.93	0.0010	U	UJ
Xylene (Total)	mg/L	100	0.027	0.0030	U	UJ

J - The associated numerical value is an estimated quantity.
J- - The associated numerical value is an estimated quantity, potentially biased low.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
italicised text indicates that value exceeds the applicable Human Health Target Decision Level.
*Laboratory detection limit exceeds Target Decision Level.

TABLE 28
SOIL ASSOCIATED WITH SEEP SAMPLES
AOI 5-5
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-5-SEEP-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	2.3		
Arsenic (Total)	mg/kg	1.6	5.7	2.1		
Barium (Total)	mg/kg	67,000	1.04	50		J
Beryllium (Total)	mg/kg	1,900	1.06	0.48		
Cadmium (Total)	mg/kg	450	0.0022	0.44		
Chromium (Total)	mg/kg	100,000	0.4	17		J
Chromium, Hexavalent	mg/kg	64	NA	2.8	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	8.8		
Copper (Total)	mg/kg	41,000	5.4	23		
Lead (Total)	mg/kg	800	0.0537	44		J
Mercury (Total)	mg/kg	310	0.1	0.037	J	J
Nickel (Total)	mg/kg	20,000	13.6	19		
Selenium (Total)	mg/kg	5,100	0.0276	0.72		
Silver (Total)	mg/kg	5,100	4.04	0.12		
Thallium (Total)	mg/kg	67	0.0569	0.091	J	J
Vanadium (Total)	mg/kg	1,000	1.59	13		
Zinc (Total)	mg/kg	100,000	6.62	570		
1,1,1-Trichloroethane	mg/kg	1200	29.8	0.0025	U	UJ
1,1,2,2-Tetrachloroethane	mg/kg	0.93	0.127	0.0025	U	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	5600	NA	0.0025	U	UJ
1,1,2-Trichloroethane	mg/kg	1.6	28.6	0.0025	U	UJ
1,1-Dichloroethane	mg/kg	1700	20.1	0.0025	U	UJ
1,1-Dichloroethene	mg/kg	410	8.28	0.0025	U	UJ
1,2,4-Trichlorobenzene	mg/kg	220	11.1	0.0025	U	UJ
1,2-Dibromo-3-chloropropane	mg/kg	2	0.0352	0.012	U	UJ
1,2-Dibromoethane	mg/kg	0.073	1.23	0.0025	U	UJ
1,2-Dichlorobenzene	mg/kg	600	2.96	0.0025	U	UJ
1,2-Dichloroethane	mg/kg	0.6	21.2	0.0025	U	UJ
1,2-Dichloropropane	mg/kg	0.74	32.7	0.0025	U	UJ
1,3-Dichlorobenzene	mg/kg	600	37.7	0.0025	U	UJ
1,4-Dichlorobenzene	mg/kg	7.9	0.546	0.0025	U	UJ
2-Butanone (MEK)	mg/kg	110000	89.8	0.028		J
2-Hexanone	mg/kg	NA	12.6	0.012	U	UJ
4-Methyl-2-pentanone (MIBK)	mg/kg	47000	443	0.012	U	UJ
Acetone	mg/kg	54000	2.5	0.44		J
Benzene	mg/kg	1.4	0.255	0.0005	J	J
Bromodichloromethane	mg/kg	1.8	0.54	0.0025	U	UJ
Bromoform	mg/kg	220	15.9	0.0025	U	UJ
Bromomethane	mg/kg	13	0.235	0.0025	U	UJ
Carbon Disulfide	mg/kg	720	0.0941	0.0058		J
Carbon Tetrachloride	mg/kg	0.55	2.98	0.0025	U	UJ
Chlorobenzene	mg/kg	530	13.1	0.0025	U	UJ
Chloroethane	mg/kg	6.5	NA	0.0025	U	UJ
Chloroform	mg/kg	0.47	1.19	0.0025	U	UJ
Chloromethane	mg/kg	160	10.4	0.0025	U	UJ
cis-1,2-Dichloroethene	mg/kg	150	NA	0.0032		J
cis-1,3-Dichloropropene	mg/kg	1.8	0.398	0.0025	U	UJ
Cyclohexane	mg/kg	140	NA	0.012	U	UJ
Dibromochloromethane	mg/kg	2.6	22.05	0.0025	U	UJ
Dichlorodifluoromethane	mg/kg	310	39.5	0.0025	U	UJ
Ethylbenzene	mg/kg	400	5.16	0.0025	U	UJ
Isopropylbenzene (Cumene)	mg/kg	2000	NA	0.00062	J	J
Methyl Acetate	mg/kg	92000	NA	0.012	U	UJ
Methyl tert-Butyl Ether (MTBE)	mg/kg	70	NA	0.0025	U	UJ
Methylcyclohexane	mg/kg	8700	NA	0.012	U	UJ
Methylene Chloride	mg/kg	21	4.05	0.012	U	UJ
Styrene	mg/kg	1700	4.69	0.0025	U	UJ
Tetrachloroethene	mg/kg	1.3	9.92	0.0025	U	UJ
Toluene	mg/kg	520	5.45	0.0025	U	UJ
trans-1,2-Dichloroethene	mg/kg	230	0.784	0.0025	U	UJ
trans-1,3-Dichloropropene	mg/kg	1.8	0.398	0.0025	U	UJ
Trichloroethene	mg/kg	0.11	12.4	0.083		J
Trichlorofluoromethane	mg/kg	2000	16.4	0.0025	U	UJ
Vinyl Chloride	mg/kg	0.75	0.646	0.0025	U	UJ
Xylene (Total)	mg/kg	420	10	0.0075	U	UJ

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 30
SUBSURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-6
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		5-6-SB-3- DS1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SB-3- DS2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SB-4- Comp.	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SB-4- DS1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SB-4- DS2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	66	mg/kg	24			2.9			14			5.1			4		
Arsenic (Total)	1.3	mg/kg	0.73		J	1.2		J	0.94		J	1.2		J	1.3		J
Barium (Total)	110	mg/kg	98			110			68		J	75		J	92		J
Beryllium (Total)	0.56	mg/kg	0.29			0.29			0.24		J	0.33		J	0.19		J
Cadmium (Total)	4	mg/kg	0.35			0.83			0.34			2			0.15		
Chromium (Total)	21	mg/kg	11		J	9.5		J	10			14		J	11		J
Chromium, Hexavalent	0.42	mg/kg	1.8	U	U	2.1	U	U	0.36	J	J	2.2	U	U	1.9	U	U
Cobalt (Total)	590	mg/kg	150		J	29		J	160		J	210		J	30		J
Copper (Total)	15	mg/kg	13		J	14		J	12		J	12		J	8		J
Lead (Total)	120	mg/kg	44			120			28			36			15		
Mercury (Total)	0.22	mg/kg	0.22			0.023	J	J	0.065			0.05			0.05		
Nickel (Total)	150	mg/kg	57		J	9.2		J	32		J	43		J	27		J
Selenium (Total)	0.65	mg/kg	0.47			0.36			0.32		J	0.56		J	0.24		J
Silver (Total)	0.5	mg/kg	0.091	J	J	0.065	J	J	0.15			0.098	J	J	0.18		
Thallium (Total)	0.12	mg/kg	0.096	J	J	0.075	J	J	0.077	J	J	0.084	J	J	0.056	J	J
Vanadium (Total)	27	mg/kg	14		J	17		J	13		J	18		J	11		J
Zinc (Total)	1100	mg/kg	620			630			340			680			130		

	Maximum Concentration		5-6-TP-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-TP-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-TP-1-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-TP-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-TP-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	66	mg/kg	7.4			66			2.3			12			32		
Arsenic (Total)	1.3	mg/kg	0.7			0.65			0.2			1			1.2		
Barium (Total)	110	mg/kg	93		J	110		J	70		J	96		J	100		J
Beryllium (Total)	0.56	mg/kg	0.31			0.35			0.15			0.37			0.56		
Cadmium (Total)	4	mg/kg	4			0.37			0.11			0.89			0.067		
Chromium (Total)	21	mg/kg	11			17			8.7			17			21		
Chromium, Hexavalent	0.42	mg/kg	2	U	U	2.1	U	U	1.6	U	U	1.5	U	U	0.42	J	J
Cobalt (Total)	590	mg/kg	180			590			72			170			220		
Copper (Total)	15	mg/kg	11		J	13		J	5.7		J	9.8		J	15		J
Lead (Total)	120	mg/kg	35			51			9			37			13		
Mercury (Total)	0.22	mg/kg	0.039	J	J	0.031	J	J	0.049	J	J	0.063			0.034	J	J
Nickel (Total)	150	mg/kg	25			150			27			130			70		
Selenium (Total)	0.65	mg/kg	0.65			0.45			0.1	U	U	0.35			0.5		
Silver (Total)	0.5	mg/kg	0.07	J	J	0.067	J	J	0.057	J	J	0.5			0.12		
Thallium (Total)	0.12	mg/kg	0.07	J	J	0.077	J	J	0.034	J	J	0.079	J	J	0.12		
Vanadium (Total)	27	mg/kg	16			16			13			20			27		
Zinc (Total)	1100	mg/kg	850	B		1100	B		32	B	J+	660	B		860	B	

Shading indicates the maximum concentration of each

- J - The associated numerical value is an estimated quantity.
- J+ - The associated numerical value is an estimated quantity, potentially biased high.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

TABLE 31
SURFACE SOIL SAMPLES
AOI 5-6
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-6-SS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	1.3			0.77			0.73			0.6		
Arsenic (Total)	mg/kg	1.6	5.7	3.4			6			6.2			4.9		
Barium (Total)	mg/kg	67,000	1.04	97		J	100		J	170		J	170		J
Beryllium (Total)	mg/kg	1,900	1.06	0.57			0.44			0.63			0.74		
Cadmium (Total)	mg/kg	450	0.0022	0.47			0.14			0.42			0.29		
Chromium (Total)	mg/kg	100,000	0.4	15			11			11			11		
Chromium, Hexavalent	mg/kg	64	NA	1.7	U	UJ	2.2	U	UJ	2.7	U	UJ	2.2	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	20			6.3			10			11		
Copper (Total)	mg/kg	41,000	5.4	22			12			12			10		
Lead (Total)	mg/kg	800	0.0537	63			92			110			69		
Mercury (Total)	mg/kg	310	0.1	0.05	J	U	0.056		U	0.065		U	0.069		U
Nickel (Total)	mg/kg	20,000	13.6	29			11			15			14		
Selenium (Total)	mg/kg	5,100	0.0276	0.96			0.73			0.8			0.77		
Silver (Total)	mg/kg	5,100	4.04	0.33			0.1			0.092	J	J	0.094	J	J
Thallium (Total)	mg/kg	67	0.0569	0.14			0.21			0.22			0.23		
Vanadium (Total)	mg/kg	1,000	1.59	17			20			19			20		
Zinc (Total)	mg/kg	100,000	6.62	150			71			190			170		

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 32
SUBSURFACE SOIL SAMPLES
AOI 5-6
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-6-SB-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SB-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SB-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SB-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.48			0.66			0.22			0.23		
Arsenic (Total)	mg/kg	1.6	5.7	29	9.1		J	6.3		J	5.9		J	7.6		J
Barium (Total)	mg/kg	67,000	1.04	1,600	73			180			76			70		
Beryllium (Total)	mg/kg	1,900	1.06	63	0.75			0.77			0.54			0.54		
Cadmium (Total)	mg/kg	450	0.0022	8	0.18			0.16			0.1			0.13		
Chromium (Total)	mg/kg	100,000	0.4	38	20		J	14		J	13		J	15		J
Chromium, Hexavalent	mg/kg	64	NA	38	1.5	U		1.7	U		0.91	J		1.6	U	
Cobalt (Total)	mg/kg	1,900	0.14	NONE	20		J	11		J	10		J	11		J
Copper (Total)	mg/kg	41,000	5.4	NONE	26		J	33		J	20		J	21		J
Lead (Total)	mg/kg	800	0.0537	NONE	25			25			14			14		
Mercury (Total)	mg/kg	310	0.1	NONE	0.045	J		0.079			0.025	J		0.024	J	
Nickel (Total)	mg/kg	20,000	13.6	130	32		J	27		J	19		J	22		J
Selenium (Total)	mg/kg	5,100	0.0276	5	0.75			2			0.27			0.61		
Silver (Total)	mg/kg	5,100	4.04	34	0.11			0.18			0.053	J		0.078	J	
Thallium (Total)	mg/kg	67	0.0569	NONE	0.25			0.4			0.14			0.16		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	25		J	16		J	18		J	18		J
Zinc (Total)	mg/kg	100,000	6.62	12,000	95			72			67			68		

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-6-SB-4-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SB-4-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-TP-3-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.32			0.29			0.37		
Arsenic (Total)	mg/kg	1.6	5.7	29	6.3		J	4.7		J	7.3		
Barium (Total)	mg/kg	67,000	1.04	1,600	65		J	67		J	40		J
Beryllium (Total)	mg/kg	1,900	1.06	63	0.9		J	0.63		J	0.52		
Cadmium (Total)	mg/kg	450	0.0022	8	0.12			0.082			0.057		
Chromium (Total)	mg/kg	100,000	0.4	38	16		J	20			15		
Chromium, Hexavalent	mg/kg	64	NA	38	1.9	U		1.2	U		1.6	J	J
Cobalt (Total)	mg/kg	1,900	0.14	NONE	13		J	12		J	11		J+
Copper (Total)	mg/kg	41,000	5.4	NONE	21		J	21		J	19		J
Lead (Total)	mg/kg	800	0.0537	NONE	17			14			14		
Mercury (Total)	mg/kg	310	0.1	NONE	0.05	J	U	0.05	J	U	0.05		
Nickel (Total)	mg/kg	20,000	13.6	130	25		J	22		J	19		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.51		J	0.52		J	0.28		
Silver (Total)	mg/kg	5,100	4.04	34	0.11			0.12			0.12		
Thallium (Total)	mg/kg	67	0.0569	NONE	0.21			0.16			0.15		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	20		J	21		J	18		
Zinc (Total)	mg/kg	100,000	6.62	12,000	76			70			62		J+

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

Underlined text indicates that value exceeds the applicable Soil Screening Level.

TABLE 33
SURFACE WATER SAMPLES
AOI 5-6
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-6-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.001	U	U	0.001	U	U
Barium (Total)	mg/L	20	0.22	0.021			0.021		
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U	0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.0002	U	U	0.0002	U	U
Chromium (Total)	mg/L	1.0	0.086	0.001	J	U	0.001	J	U
Chromium, Hexavalent	mg/L	1.0	0.011	0.0007	J	J	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.0014			0.0013		
Copper (Total)	mg/L	1.3	0.0093	0.0011		J+	0.0016		J+
Lead (Total)	mg/L	0.15	0.0064	0.001	U	U	0.001	U	U
Mercury (Total)	mg/L	0.000012	0.00091	0.0002*	U	U	0.0002*	U	U
Nickel (Total)	mg/L	4.6	0.052	0.0083			0.0087		
Selenium (Total)	mg/L	11.0	0.005	0.001	U	U	0.001	U	U
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U	0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.001	J	U	0.001	J	U
Zinc (Total)	mg/L	69.0	0.12	0.0095	B	J+	0.0088	B	J+
Hardness as CaCO3	mg/L			210			210		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 34
SEDIMENT SAMPLES
AOI 5-6
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-6-SED-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-6-SED-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	0.23		J+	3.5		
Arsenic (Total)	mg/kg	3.9	9.79	0.73			0.62		
Barium (Total)	mg/kg	54,000	NA	32			28		
Beryllium (Total)	mg/kg	1,500	NA	0.75			0.21		
Cadmium (Total)	mg/kg	370	0.99	0.19			0.11		
Chromium (Total)	mg/kg	1,000,000	43.4	12		J+	14		J+
Chromium, Hexavalent	mg/kg	300	NA	1.3	U	U	2.4	U	U
Cobalt (Total)	mg/kg	9,000	50	13			23		
Copper (Total)	mg/kg	31,000	31.6	18		J	13		J
Lead (Total)	mg/kg	4,000	35.8	23			19		
Mercury (Total)	mg/kg	230	0.174	0.05	J	U	0.052		J+
Nickel (Total)	mg/kg	16,000	22.7	36			54		
Selenium (Total)	mg/kg	3,900	NA	0.46			0.27		
Silver (Total)	mg/kg	3,900	0.5	0.18			0.11		
Thallium (Total)	mg/kg	52	NA	0.13			0.057	J	J
Vanadium (Total)	mg/kg	780	NA	12			15		
Zinc (Total)	mg/kg	230,000	121	100	B	J	69	B	J

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is corrected.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 35
SURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-7
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-7-CS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-CS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-CS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-CS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-CS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-CS-6	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-CS-7	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	1.6	mg/kg	410	0.142	0.45			0.33			1.6			0.47			1.6			0.54			0.47		
Arsenic (Total)	28	mg/kg	1.6	5.7	1.7			2.5			28			1.6			3.6			2.1			1.8		
Barium (Total)	1000	mg/kg	67,000	1.04	890			770			250			670			690			900			760		
Beryllium (Total)	0.63	mg/kg	1,900	1.06	0.38			0.39			0.63			0.46			0.38			0.51			0.48		
Cadmium (Total)	1.2	mg/kg	450	0.0022	0.54			0.071			0.12			0.25			0.92			0.39			0.27		
Chromium (Total)	25	mg/kg	100,000	0.4	6.5		J	3.1		J	22		J	22		J	25		J	8.9		J	8.5		J
Chromium, Hexavalent	0.53	mg/kg	64	NA	17	U	R	1.8	U	R	43	U	R	1.9	U	R	40	U	R	0.53	J	J	17	U	R
Cobalt (Total)	11	mg/kg	1,900	0.14	4.3		J	2.5		J	11		J	5.1		J	4.7		J	8.5		J	6.4		J
Copper (Total)	38	mg/kg	41,000	5.4	12		J	9.3		J	17		J	14		J	28		J	15		J	13		J
Lead (Total)	180	mg/kg	800	0.0537	180			30			39			140			75			180			130		
Mercury (Total)	0.13	mg/kg	310	0.1	0.043	J	J	0.029	J	J	0.13			0.039	J	J	0.056			0.047	J	J	0.037	J	J
Nickel (Total)	24	mg/kg	20,000	13.6	7.7		J	6.8		J	20		J	8.2		J	24		J	10		J	12		J
Selenium (Total)	4	mg/kg	5,100	0.0276	2.9		J-	1		J-	1.4		J-	1.5		J-	1.5		J-	1.1		J-	0.96		J-
Silver (Total)	0.84	mg/kg	5,100	4.04	0.84			0.28			0.28			0.44			0.62			0.4			0.42		
Thallium (Total)	0.19	mg/kg	67	0.0569	0.076	J	J	0.088	J	J	0.19			0.077	J	J	0.093	J	J	0.09	J	J	0.091	J	J
Vanadium (Total)	47	mg/kg	1,000	1.59	9.5		J	5.9		J	47		J	8		J	8.5		J	11		J	14		J
Zinc (Total)	2000	mg/kg	100,000	6.62	2000	B	J	370	B	J	240	B	J	680	B	J	1100	B	J	770	B	J	660	B	J

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-7-CS-8	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-CS-DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-DS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-DS-7	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	(Discrete Sample) 5-7-SS-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	(Discrete Sample) 5-7-SS-5	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	1.6	mg/kg	410	0.142	0.56			0.61			0.33			0.11			0.38			0.27		
Arsenic (Total)	28	mg/kg	1.6	5.7	12			2.5			0.98			0.6			0.98			1.4		
Barium (Total)	1000	mg/kg	67,000	1.04	750			840			630			77			410	J		1000		J
Beryllium (Total)	0.63	mg/kg	1,900	1.06	0.47			0.43			0.5			0.077	J	J	0.33			0.51		
Cadmium (Total)	1.2	mg/kg	450	0.0022	0.73			0.8			0.049	J	J	0.23			1.2			0.026	J	J
Chromium (Total)	25	mg/kg	100,000	0.4	19		J	19		J	3.8		J	1.9		J	8.7		J	3.8		J
Chromium, Hexavalent	0.53	mg/kg	64	NA	45	U	R	2	U	R	0.35	J	J	17	U	R	0.59	J	U	1.4	U	U
Cobalt (Total)	11	mg/kg	1,900	0.14	6.6		J	4.7		J	2.4		J	2.1		J	3.1			3.7		
Copper (Total)	38	mg/kg	41,000	5.4	38		J	31		J	12		J	6.6		J	15			12		
Lead (Total)	180	mg/kg	800	0.0537	120			80			20			100			130		J	16		J
Mercury (Total)	0.13	mg/kg	310	0.1	0.061			0.061			0.028	J	J	0.013	J	J	0.071			0.041	J	J
Nickel (Total)	24	mg/kg	20,000	13.6	12		J	22		J	8.1		J	5		J	9.1			8.1		
Selenium (Total)	4	mg/kg	5,100	0.0276	3.8		J-	1.5		J-	0.9		J-	0.63		J-	4			1.1		
Silver (Total)	0.84	mg/kg	5,100	4.04	0.43			0.72			0.25			0.33			0.19			0.072	J	J
Thallium (Total)	0.19	mg/kg	67	0.0569	0.09	J	J	0.098	J	J	0.073	J	J	0.029	J	J	0.14			0.1		
Vanadium (Total)	47	mg/kg	1,000	1.59	11		J	9.3		J	7		J	3.5		J	12			6.4		
Zinc (Total)	2000	mg/kg	100,000	6.62	820	B	J	1300	B	J	67	B	J	710	B	J	670			33		

Shading indicates the maximum concentration of each COPI.

- J - The associated numerical value is an estimated quantity.
- J- - The associated numerical value is an estimated quantity, potentially biased low.
- R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level

Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 36
SUBSURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-7
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		5-7-SB-1- Comp.	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SB-2- Comp.	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SB-2- Comp.-DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-TP-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.84	mg/kg	0.84			0.23			0.2			0.3		J+
Arsenic (Total)	17	mg/kg	17		J	1		J	1.4		J	1.2		
Barium (Total)	1400	mg/kg	280		J	1400		J	1300		J	1300		
Beryllium (Total)	0.64	mg/kg	0.5		J	0.54		J	0.52		J	0.6		
Cadmium (Total)	0.45	mg/kg	0.43			0.21			0.25			0.37		
Chromium (Total)	20	mg/kg	20			8.1			9.2			11		
Chromium, Hexavalent	0.71	mg/kg	1.8	U	U	1.2	U	U	0.71	J	J	1.9	U	U
Cobalt (Total)	29	mg/kg	3.5		J	4.3		J	6.1		J	29		J+
Copper (Total)	18	mg/kg	10		J	13		J	13		J	16		J
Lead (Total)	510	mg/kg	55			72			130			510		
Mercury (Total)	0.11	mg/kg	0.1			0.05	J	U	0.05	J	U	0.054		J+
Nickel (Total)	14	mg/kg	14		J	10		J	13		J	12		
Selenium (Total)	1.8	mg/kg	1.7		J	1.1		J	1		J	1.6		
Silver (Total)	0.4	mg/kg	0.27			0.22			0.23			0.4		
Thallium (Total)	0.27	mg/kg	0.27			0.12			0.11			0.1		
Vanadium (Total)	36	mg/kg	36		J	11		J	13		J	12		
Zinc (Total)	1900	mg/kg	1800			1100			1300			1600		

	Maximum Concentration		5-7-TP-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-TP-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-TP-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-TP-3-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.84	mg/kg	0.27		J+	0.37		J+	0.17		J+	0.18		J+
Arsenic (Total)	17	mg/kg	0.97			7.9			0.69			2		
Barium (Total)	1400	mg/kg	1100			1100			1100			1100		
Beryllium (Total)	0.64	mg/kg	0.52			0.64			0.52			0.53		
Cadmium (Total)	0.45	mg/kg	0.38			0.45			0.15			0.14		
Chromium (Total)	20	mg/kg	8.9			13			4.8			5.5		
Chromium, Hexavalent	0.71	mg/kg	2	U	U	1.7	U	U	1.5	U	U	1.5	U	U
Cobalt (Total)	29	mg/kg	4		J+	5.4		J+	3.6		J+	4.9		J+
Copper (Total)	18	mg/kg	13		J	18		J	9.3		J	10		J
Lead (Total)	510	mg/kg	160			82			47			53		
Mercury (Total)	0.11	mg/kg	0.062		J+	0.11			0.05	J	U	0.055		J+
Nickel (Total)	14	mg/kg	8.5			12			9.3			11		
Selenium (Total)	1.8	mg/kg	0.86			1.8			0.69			0.74		
Silver (Total)	0.4	mg/kg	0.21			0.37			0.11			0.18		
Thallium (Total)	0.27	mg/kg	0.082	J	J	0.14			0.081	J	J	0.11		
Vanadium (Total)	36	mg/kg	10			19			7.3			8.8		
Zinc (Total)	1900	mg/kg	1900			1600			440			420		

Shading indicates the maximum concentration of each

- J - The associated numerical value is an estimated quantity.
- J+ - The associated numerical value is an estimated quantity, potentially biased high.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

TABLE 37
SURFACE SOIL SAMPLES
AOI 5-7
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-7-SS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	0.37			0.39			0.51		
Arsenic (Total)	mg/kg	1.6	5.7	3.7			2.1			3.8		
Barium (Total)	mg/kg	67,000	1.04	150		J	420		J	350		J
Beryllium (Total)	mg/kg	1,900	1.06	0.27			0.46			0.32		
Cadmium (Total)	mg/kg	450	0.0022	0.12			0.21			0.14		
Chromium (Total)	mg/kg	100,000	0.4	5.8			5.7			5.1		
Chromium, Hexavalent	mg/kg	64	NA	0.22	J	J	2	U	UJ	0.84	J	J
Cobalt (Total)	mg/kg	1,900	0.14	2.9			4.1			3.4		
Copper (Total)	mg/kg	41,000	5.4	9.4			15			12		
Lead (Total)	mg/kg	800	0.0537	33			50			31		
Mercury (Total)	mg/kg	310	0.1	0.05	J	U	0.05		U	0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	5.7			11			9.2		
Selenium (Total)	mg/kg	5,100	0.0276	1.3			1			1.2		
Silver (Total)	mg/kg	5,100	4.04	0.11			0.12			0.098	J	J
Thallium (Total)	mg/kg	67	0.0569	0.086	J	J	0.085	J	J	0.098	J	J
Vanadium (Total)	mg/kg	1,000	1.59	7.8			8.1			6.5		
Zinc (Total)	mg/kg	100,000	6.62	92			200			62		

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 38
SUBSURFACE SOIL SAMPLES
AOI 5-7
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-7-SB-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SB-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SB-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SB-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.82			1.5			1.3			1.3		
Arsenic (Total)	mg/kg	1.6	5.7	29	14		J	23		J	20		J	110		J
Barium (Total)	mg/kg	67,000	1.04	1,600	73		J	91		J	67		J	86		J
Beryllium (Total)	mg/kg	1,900	1.06	63	0.5		J	0.9		J	0.74		J	0.85		J
Cadmium (Total)	mg/kg	450	0.0022	8	0.014	J		0.036	J		0.061			0.047	J	
Chromium (Total)	mg/kg	100,000	0.4	38	19			23			20			26		
Chromium, Hexavalent	mg/kg	64	NA	38	2.1	U		1.6	J		1.3	U		0.99	J	
Cobalt (Total)	mg/kg	1,900	0.14	NONE	23		J	10		J	13		J	6.2		J
Copper (Total)	mg/kg	41,000	5.4	NONE	19		J	21		J	21		J	21		J
Lead (Total)	mg/kg	800	0.0537	NONE	25			26			23			53		
Mercury (Total)	mg/kg	310	0.1	NONE	0.05			0.15			0.099			0.11		
Nickel (Total)	mg/kg	20,000	13.6	130	14		J	26		J	29		J	24		J
Selenium (Total)	mg/kg	5,100	0.0276	5	0.91		J	1.9		J	1.3		J	3.4		J
Silver (Total)	mg/kg	5,100	4.04	34	0.062	J		0.1			0.12			0.1		
Thallium (Total)	mg/kg	67	0.0569	NONE	0.18			0.25			0.33			0.44		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	26		J	39		J	35		J	69		J
Zinc (Total)	mg/kg	100,000	6.62	12,000	68			84			89			81		

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-7-SB-2- DUP 1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-TP-1-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-TP-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-TP-3-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.73			0.15		J+	1.5			1.5		
Arsenic (Total)	mg/kg	1.6	5.7	29	19		J	0.39			38			37		
Barium (Total)	mg/kg	67,000	1.04	1,600	57		J	57			110			140		
Beryllium (Total)	mg/kg	1,900	1.06	63	0.85		J	0.9			0.52			0.59		
Cadmium (Total)	mg/kg	450	0.0022	8	0.037	J		0.08			0.016	J	J	0.019	J	J
Chromium (Total)	mg/kg	100,000	0.4	38	24			22			25			24		
Chromium, Hexavalent	mg/kg	64	NA	38	1.7	U		1.8	U	U	2.5	U	U	0.33	J	J
Cobalt (Total)	mg/kg	1,900	0.14	NONE	7.5		J	22		J+	5.1		J+	6.5		J+
Copper (Total)	mg/kg	41,000	5.4	NONE	18		J	16		J	14		J	22		J
Lead (Total)	mg/kg	800	0.0537	NONE	19			19			33			36		
Mercury (Total)	mg/kg	310	0.1	NONE	0.095			0.05	J	U	0.17			0.25		
Nickel (Total)	mg/kg	20,000	13.6	130	26		J	31			17			16		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.93		J	0.4			1.6			1.8		
Silver (Total)	mg/kg	5,100	4.04	34	0.11			0.051	J	J	0.18			0.17		
Thallium (Total)	mg/kg	67	0.0569	NONE	0.22			0.1			0.41			0.42		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	37		J	28			59			48		
Zinc (Total)	mg/kg	100,000	6.62	12,000	73			120		J+	56		J+	78		J+

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

Underlined text indicates that value exceeds the applicable Soil Screening Level.

TABLE 39
SURFACE WATER SAMPLES
AOI 5-7
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-7-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SW-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SW-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.0017			0.0014			0.0017			0.0012		
Barium (Total)	mg/L	20	0.22	0.023			0.023			0.03			0.014		J-
Beryllium (Total)	mg/L	0.28	0.0036	0.0074			0.0079			0.0083			0.0053		
Cadmium (Total)	mg/L	0.05	0.0025	0.0017			0.0016			0.0017			0.0015		
Chromium (Total)	mg/L	1.0	0.086	0.00067	J	J	0.00093	J	J	0.001		U	0.0016		
Chromium, Hexavalent	mg/L	1.0	0.011	0.0024	J	J	0.002	J	J	0.0019	U	J	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.75			0.64			0.78			0.79		J-
Copper (Total)	mg/L	1.3	0.0093	0.0048			0.005			0.0048			0.0019		
Lead (Total)	mg/L	0.15	0.0064	0.0021			0.0021			0.0032			0.0028		
Mercury (Total)	mg/L	0.000012	0.00091	0.0002*	U	UJ	0.0002*	U	UJ	0.0002*	U	UJ	0.0002*	U	U
Nickel (Total)	mg/L	4.6	0.052	1.4		R	1.2		R	1.4		R	1.3		
Selenium (Total)	mg/L	11.0	0.005	0.006			0.0046			0.0056			0.0039		
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.00017	J	J	0.001	U	U	0.00017	J	J	0.0003	J	J
Vanadium (Total)	mg/L	NA	0.012	0.0005	J	J	0.0004	J	J	0.00048	J	J	0.00049	J	J
Zinc (Total)	mg/L	69.0	0.12	2.5	B	J	2.1	B	J	2.9	B	J	2.5	B	J
Hardness as CaCO3	mg/L			1200			990			1200			1000		J

J - The associated numerical value is an estimated quantity.

J- - The associated numerical value is an estimated quantity, potentially biased low.

R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 40
SEDIMENT SAMPLES
AOI 5-7
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-7-SED-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SED-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SED-Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SED-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	3.8			0.81			2.8			1.2		
Arsenic (Total)	mg/kg	3.9	9.79	3.5			8.6			3.7			11		
Barium (Total)	mg/kg	54,000	NA	910		J	490		J	850		J	950		J
Beryllium (Total)	mg/kg	1,500	NA	0.29			0.21			0.29			0.43		
Cadmium (Total)	mg/kg	370	0.99	0.21			0.03		J	0.24			0.041	J	
Chromium (Total)	mg/kg	1,000,000	43.4	13			11			9.4			15		J
Chromium, Hexavalent	mg/kg	300	NA	2	U	UJ	1.1	J	UJ	2.7	U	UJ	0.71		U
Cobalt (Total)	mg/kg	9,000	50	9.5			9.7			13			4.3		
Copper (Total)	mg/kg	31,000	31.6	27			11		J+	25			19		
Lead (Total)	mg/kg	4,000	35.8	80			31			66			20		J
Mercury (Total)	mg/kg	230	0.174	0.05	J	U	0.05	J	U	0.05	J	U	0.099		
Nickel (Total)	mg/kg	16,000	22.7	11			8.5			11			12		
Selenium (Total)	mg/kg	3,900	NA	1.9		J	1.3		J	1.8		J	8.9		
Silver (Total)	mg/kg	3,900	0.5	0.13			0.088	J	J	0.17			0.1		
Thallium (Total)	mg/kg	52	NA	0.071	J	J	0.16			0.075	J	J	0.16		
Vanadium (Total)	mg/kg	780	NA	10			17			9.7			21		
Zinc (Total)	mg/kg	230,000	121	170			120			170			130		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 41
SEEP SAMPLES
AOI 5-7
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-7-SEEP-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SEEP-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SEEP-DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U	0.00076	J	J
Arsenic (Total)	mg/L	0.1	0.15	0.0021			0.0016			0.002		
Barium (Total)	mg/L	20	0.22	0.079		J-	0.049		J-	0.11		J-
Beryllium (Total)	mg/L	0.28	0.0036	0.011			0.012			0.01		
Cadmium (Total)	mg/L	0.05	0.0025	0.0022			0.0023			0.0022		
Chromium (Total)	mg/L	1.0	0.086	0.0015			0.0024			0.0017		
Chromium, Hexavalent-Dissolved	mg/L	1.0	0.011	0.005	U	U	0.005	J	U	0.005	U	UJ
Cobalt (Total)	mg/L	NA	0.024	0.9		J-	0.98		J-	0.77		J-
Copper (Total)	mg/L	1.3	0.0093	0.0047			0.0047			0.0066		
Lead (Total)	mg/L	0.15	0.0064	0.0037			0.0012			0.0076		
Mercury (Total)	mg/L	0.00012	0.00091	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U
Nickel (Total)	mg/L	4.6	0.052	1.6			1.8			1.4		
Selenium (Total)	mg/L	11.0	0.005	0.0074			0.0038			0.0076		
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.00023	J	J	0.00024	J	J	0.00021	J	J
Vanadium (Total)	mg/L	NA	0.012	0.0032			0.0047			0.0042		
Zinc (Total)	mg/L	69.0	0.12	3.3	B	J	3.1	B	J	3.3	B	J
1,1,1-Trichloroethane	mg/L	2	0.076	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1,2,2-Tetrachloroethane	mg/L	NA	0.38	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1,2-Trichloroethane	mg/L	0.05	0.5	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1-Dichloroethane	mg/L	NA	0.047	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1-Dichloroethene	mg/L	0.07	0.065	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2,4-Trichlorobenzene	mg/L	0.7	0.03	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2-Dibromo-3-chloropropane	mg/L	0.002	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2-Dibromoethane	mg/L	0.0005	NA	0.001*	U	UJ	0.001*	U	UJ	0.001*	U	UJ
1,2-Dichlorobenzene	mg/L	6	0.014	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2-Dichloroethane	mg/L	0.05	0.91	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2-Dichloropropane	mg/L	0.05	0.36	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,3-Dichlorobenzene	mg/L	NA	0.038	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,4-Dichlorobenzene	mg/L	0.75	0.0094	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
2-Butanone (MEK)	mg/L	NA	2.2	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
2-Hexanone	mg/L	NA	0.099	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
4-Methyl-2-pentanone (MIBK)	mg/L	NA	0.17	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Acetone	mg/L	NA	1.7	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Benzene	mg/L	0.05	0.114	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Bromodichloromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Bromoform	mg/L	NA	0.23	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Bromomethane	mg/L	NA	0.016	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Carbon Disulfide	mg/L	NA	0.015	0.005	J	UJ	0.005	J	UJ	0.005	J	UJ
Carbon Tetrachloride	mg/L	NA	0.24	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Chlorobenzene	mg/L	1	0.047	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Chloroethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Chloroform	mg/L	NA	0.14	0.001	U	UJ	0.00017	J	J	0.001	U	UJ
Chloromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
cis-1,2-Dichloroethene	mg/L	0.7	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
cis-1,3-Dichloropropene	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Cyclohexane	mg/L	NA	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Dibromochloromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Dichlorodifluoromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Ethylbenzene	mg/L	7	0.014	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Isopropylbenzene (Cumene)	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Methyl Acetate	mg/L	NA	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Methyl tert-Butyl Ether (MTBE)	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Methylcyclohexane	mg/L	NA	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Methylene Chloride	mg/L	0.05	0.94	0.001	U	UJ	0.001	J	UJ	0.001	J	UJ
Styrene	mg/L	1	0.032	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Tetrachloroethene	mg/L	0.05	0.045	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Toluene	mg/L	10	0.253	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
trans-1,2-Dichloroethene	mg/L	1	0.97	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
trans-1,3-Dichloropropene	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Trichloroethene	mg/L	0.05	0.047	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Trichlorofluoromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Vinyl Chloride	mg/L	0.02	0.93	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Xylene (Total)	mg/L	100	0.027	0.003	U	UJ	0.003	U	UJ	0.003	U	UJ

J - The associated numerical value is an estimated quantity.

J- - The associated numerical value is an estimated quantity, potentially biased low.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 42
SOIL ASSOCIATED WITH SEEP SAMPLES
AOI 5-7
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-7-SEEP-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SEEP-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-SEEP- DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	9.4			0.52			9		
Arsenic (Total)	mg/kg	1.6	5.7	4.7			6.3			4.3		
Barium (Total)	mg/kg	67,000	1.04	350		J	530		J	330		J
Beryllium (Total)	mg/kg	1,900	1.05	3.4			0.64			3		
Cadmium (Total)	mg/kg	450	0.0022	0.1			0.016	J	J	0.15		
Chromium (Total)	mg/kg	100,000	0.4	2.7		J	7.3		J	2.9		J
Chromium, Hexavalent	mg/kg	84	NA	1.8	J	J	1.4	U	U	3.3	J	J
Cobalt (Total)	mg/kg	1,900	0.14	6			3.6			10		
Copper (Total)	mg/kg	41,000	5.4	14			8			21		
Lead (Total)	mg/kg	800	0.0537	44		J	29		J	30		J
Mercury (Total)	mg/kg	310	0.1	0.029	J	J	0.045	J	J	0.029	J	J
Nickel (Total)	mg/kg	20,000	13.6	22			6.2			28		
Selenium (Total)	mg/kg	5,100	0.0276	26			0.94			28		
Silver (Total)	mg/kg	5,100	4.04	0.085	J	J	0.061	J		0.093	J	J
Thallium (Total)	mg/kg	67	0.0569	0.045	J	J	0.15			0.063	J	J
Vanadium (Total)	mg/kg	1,000	1.59	15			16			13		
Zinc (Total)	mg/kg	100,000	6.52	270			78			370		
1,1,1-Trichloroethane	mg/kg	1200	29.8	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,1,2,2-Tetrachloroethane	mg/kg	0.93	0.127	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	5600	NA	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,1,2-Trichloroethane	mg/kg	1.6	28.6	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,1-Dichloroethane	mg/kg	1700	20.1	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,1-Dichloroethane	mg/kg	410	8.29	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,2,4-Trichlorobenzene	mg/kg	220	11.1	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,2-Dibromo-3-chloropropane	mg/kg	2	0.0352	0.018	U	UJ	0.0071	U	UJ	0.017	U	UJ
1,2-Dibromoethane	mg/kg	0.073	1.23	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,2-Dichlorobenzene	mg/kg	600	2.96	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,2-Dichloroethane	mg/kg	0.6	21.2	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,2-Dichloropropane	mg/kg	0.74	32.7	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,3-Dichlorobenzene	mg/kg	600	37.7	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
1,4-Dichlorobenzene	mg/kg	7.9	0.546	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
2-Butanone (MEK)	mg/kg	110000	89.6	0.054		J	0.008		J	0.045		J
2-Hexanone	mg/kg	NA	12.6	0.018	U	UJ	0.0071	U	UJ	0.017	U	UJ
4-Methyl-2-pentanone (MIBK)	mg/kg	47000	443	0.018	U	UJ	0.0071	U	UJ	0.017	U	UJ
Acetone	mg/kg	54000	2.5	0.6		J	0.05		J	0.51		J
Benzene	mg/kg	1.4	0.255	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Bromodichloromethane	mg/kg	1.8	0.54	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Bromoform	mg/kg	220	15.9	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Bromomethane	mg/kg	13	0.235	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Carbon Disulfide	mg/kg	720	0.0941	0.0071		J	0.0014	U	UJ	0.0089		J
Carbon Tetrachloride	mg/kg	0.55	2.98	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Chlorobenzene	mg/kg	550	13.1	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Chloroethane	mg/kg	6.5	NA	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Chloroform	mg/kg	0.47	1.19	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Chloromethane	mg/kg	160	10.4	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
cis-1,2-Dichloroethane	mg/kg	150	NA	0.0036	U	UJ	0.00081	J	J	0.0033	U	UJ
cis-1,3-Dichloropropene	mg/kg	1.8	0.398	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Cyclohexane	mg/kg	140	NA	0.018	U	UJ	0.0071	U	UJ	0.017	U	UJ
Dibromochloromethane	mg/kg	2.6	22.05	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Dichlorodifluoromethane	mg/kg	310	39.5	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Ethylbenzene	mg/kg	400	5.16	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Isopropylbenzene (Cumene)	mg/kg	2000	NA	0.00093	J	J	0.0014	U	UJ	0.0033	U	UJ
Methyl Acetate	mg/kg	92000	NA	0.018	U	UJ	0.0071	U	UJ	0.017	U	UJ
Methyl tert-Butyl Ether (MTBE)	mg/kg	70	NA	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Methylcyclohexane	mg/kg	8700	NA	0.018	U	UJ	0.0071	U	UJ	0.017	U	UJ
Methylene Chloride	mg/kg	21	4.05	0.018	U	UJ	0.0071	U	UJ	0.017	U	UJ
Styrene	mg/kg	1700	4.69	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Tetrachloroethene	mg/kg	1.3	9.92	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Toluene	mg/kg	520	5.45	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
trans-1,2-Dichloroethene	mg/kg	230	0.784	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
trans-1,3-Dichloropropene	mg/kg	1.8	0.398	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Trichloroethene	mg/kg	0.11	12.4	0.0036	U	UJ	0.0014		J	0.0033	U	UJ
Trichlorofluoromethane	mg/kg	2000	15.4	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Vinyl Chloride	mg/kg	0.75	0.646	0.0036	U	UJ	0.0014	U	UJ	0.0033	U	UJ
Xylene (Total)	mg/kg	420	10	0.011	U	UJ	0.0043	U	UJ	0.01	U	UJ

J - The associated numerical value is an estimated quantity.
 J- - The associated numerical value is an estimated quantity, potentially biased low.
 U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
 UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
 B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 43
SURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-9
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-9-CS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-CS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-CS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-DS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-DS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.62	mg/kg	410	0.142	0.59		J	0.48		J	0.53		J	0.51		J	0.62		J
Arsenic (Total)	11	mg/kg	1.6	5.7	3.3		J-	11		J-	0.77		J-	3.3		J-	1		J-
Barium (Total)	110	mg/kg	67,000	1.04	110	B	J	93	B	J	34	B	J	84	B	J	44	B	J
Beryllium (Total)	0.72	mg/kg	1,900	1.06	0.69			0.61			0.13			0.72			0.13		
Cadmium (Total)	3.9	mg/kg	450	0.0022	0.25			3.9			0.008	J	J	0.42			0.05	U	U
Chromium (Total)	15	mg/kg	100,000	0.4	15		J-	9.7		J-	2.4		J-	15		J-	2		J-
Chromium, Hexavalent	11	mg/kg	64	NA	11		J	0.43	J	UJ	2.1	U	UJ	2.1	U	UJ	0.43	J	UJ
Cobalt (Total)	15	mg/kg	1,900	0.14	15		J-	7.7		J-	0.5		J-	13		J-	0.32		J-
Copper (Total)	21	mg/kg	41,000	5.4	21		J-	12		J-	4		J-	21		J-	4.5		J-
Lead (Total)	180	mg/kg	800	0.0537	40			180			14			53			16		
Mercury (Total)	0.064	mg/kg	310	0.1	0.027	J	J	0.027	J	J	0.036	J	J	0.027	J	J	0.064		
Nickel (Total)	24	mg/kg	20,000	13.6	22		J-	14		J-	1		J-	24		J-	0.6		J-
Selenium (Total)	17	mg/kg	5,100	0.0276	0.62		J-	17		J-	0.39		J-	0.76		J-	0.58		J-
Silver (Total)	0.66	mg/kg	5,100	4.04	0.44			0.66			0.17			0.47			0.14		
Thallium (Total)	0.16	mg/kg	67	0.0569	0.14		J	0.12		J	0.12		J	0.16		J	0.15		J
Vanadium (Total)	17	mg/kg	1,000	1.59	16		J	11		J	3.8		J	17		J	3.3		J
Zinc (Total)	100000	mg/kg	100,000	6.62	950	B	J	100000	B	J	16	B	J+	3600	B	J	9.6	B	J+

Shading indicates the maximum concentration of each COPI.

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

J- - The associated numerical value is an estimated quantity, potentially biased low.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 44
SUBSURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-9
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		5-9-TP-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-TP-1- Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-TP-3-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.35	mg/kg	0.31		J+	0.35		J+	0.3		J+
Arsenic (Total)	4.4	mg/kg	2.6			4.4			0.73		
Barium (Total)	540	mg/kg	57			61			540		
Beryllium (Total)	0.62	mg/kg	0.48			0.62			0.61		
Cadmium (Total)	0.073	mg/kg	0.056			0.073			0.036		J
Chromium (Total)	14	mg/kg	9.8			14			8.8		
Chromium, Hexavalent	0.61	mg/kg	0.61	J	J	0.17	J	J	1.6	U	U
Cobalt (Total)	9.1	mg/kg	5.7		J+	9.1		J+	5		J+
Copper (Total)	17	mg/kg	14		J	17		J	13		J
Lead (Total)	17	mg/kg	15			17			15		
Mercury (Total)	0.069	mg/kg	0.069			0.052		J+	0.051		J+
Nickel (Total)	16	mg/kg	12			16			14		
Selenium (Total)	0.45	mg/kg	0.33			0.31			0.45		
Silver (Total)	0.1	mg/kg	0.1			0.065	J	J	0.1		
Thallium (Total)	0.17	mg/kg	0.17			0.14			0.13		
Vanadium (Total)	16	mg/kg	13			16			10		
Zinc (Total)	65	mg/kg	45		J+	59		J+	65		J+

Shading indicates the maximum concentration of eac

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

TABLE 45
SURFACE SOIL SAMPLES
AOI 5-9
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-9-SS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-SS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	0.32			0.27		
Arsenic (Total)	mg/kg	1.6	5.7	3.3			2.3		
Barium (Total)	mg/kg	67,000	1.04	110		J	60		J
Beryllium (Total)	mg/kg	1,900	1.06	0.62			0.5		
Cadmium (Total)	mg/kg	450	0.0022	0.079			0.24		
Chromium (Total)	mg/kg	100,000	0.4	15			9.6		
Chromium, Hexavalent	mg/kg	64	NA	2.1	U	UJ	2.6	U	UJ
Cobalt (Total)	mg/kg	1,900	0.14	8.5			9.1		
Copper (Total)	mg/kg	41,000	5.4	20			17		
Lead (Total)	mg/kg	800	0.0537	32			25		
Mercury (Total)	mg/kg	310	0.1	0.05	J	U	0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	19			15		
Selenium (Total)	mg/kg	5,100	0.0276	0.52			0.41		
Silver (Total)	mg/kg	5,100	4.04	0.12			0.099	J	J
Thallium (Total)	mg/kg	67	0.0569	0.17			0.12		
Vanadium (Total)	mg/kg	1,000	1.59	15			11		
Zinc (Total)	mg/kg	100,000	6.62	77			100		

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 46
SUBSURFACE SOIL SAMPLES
AOI 5-9
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-9-SB-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-SB-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-SB-1-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-TP-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-TP-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.42		J+	0.31		J+	0.32		J+	3.1			0.25		J+
Arsenic (Total)	mg/kg	1.6	5.7	29	<i>4.1</i>			2.9			2.2			79			<i>1.8</i>		
Barium (Total)	mg/kg	67,000	1.04	1,600	94			120			100			190			120		
Beryllium (Total)	mg/kg	1,900	1.06	63	0.8			0.93			0.76			2.4			0.98		
Cadmium (Total)	mg/kg	450	0.0022	8	0.19			0.13			0.13			1.1			0.19		
Chromium (Total)	mg/kg	100,000	0.4	38	20			20			15			34			23		
Chromium, Hexavalent	mg/kg	64	NA	38	2.1		J	0.21	J	J	1.7	U	UJ	1.3	J	J	1.6	U	U
Cobalt (Total)	mg/kg	1,900	0.14	NONE	18			15			12			23		J+	18		J+
Copper (Total)	mg/kg	41,000	5.4	NONE	29		J	27		J	23		J	35		J	28		J
Lead (Total)	mg/kg	800	0.0537	NONE	24			17			17			80			17		
Mercury (Total)	mg/kg	310	0.1	NONE	0.05	J	U	0.05	J	U	0.05	J	U	0.28			0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	130	34			29			24			150			33		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.56		J-	0.51		J-	0.59		J-	1.4			0.33		
Silver (Total)	mg/kg	5,100	4.04	34	0.12			0.12			0.11			0.32			0.094	J	J
Thallium (Total)	mg/kg	67	0.0569	NONE	0.19			0.17			0.17			0.73			0.14		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	21			23			16			44			20		
Zinc (Total)	mg/kg	100,000	6.62	12,000	590	B	J	92	B	J	75	B	J	240			100		J+

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 J- - The associated numerical value is an estimated quantity, potentially biased low.
 U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
 UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
 B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.
Underlined text indicates that value exceeds the applicable Soil Screening Level.

TABLE 47
SURFACE WATER SAMPLES
AOI 5-9
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-9-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-SW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-SW-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.0019			0.0023			0.0018		
Barium (Total)	mg/L	20	0.22	0.12			0.035			0.034		
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U	0.001	U	U	0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.00018	J	J	0.00015	J	J	0.0002	U	U
Chromium (Total)	mg/L	1.0	0.086	0.0014			0.001	U	U	0.00075	J	J
Chromium, Hexavalent	mg/L	1.0	0.011	0.01	U	U	0.0012	J	J	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.038			0.0071			0.0014		
Copper (Total)	mg/L	1.3	0.0093	0.0071			0.0067			0.0027		
Lead (Total)	mg/L	0.15	0.0064	0.0041			0.003			0.001		
Mercury (Total)	mg/L	0.000012	0.00091	0.0002*	U	UJ	0.0002*	U	UJ	0.0002*	U	UJ
Nickel (Total)	mg/L	4.6	0.052	0.029		R	0.02		R	0.0044		R
Selenium (Total)	mg/L	11.0	0.005	0.001	U	U	0.00096	J	J	0.001	U	U
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U	0.0002*	U	U	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U	0.001	U	U	0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.0023			0.00098	J	J	0.0014		
Zinc (Total)	mg/L	69.0	0.12	0.083	B	J	0.084	B	J	0.02	B	J+
Hardness as CaCO3	mg/L			96			48			38		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 48
SEDIMENT SAMPLES
AOI 5-9
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-9-SED-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-SED-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-SED-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	0.52			0.58			0.53		
Arsenic (Total)	mg/kg	3.9	9.79	2.6			2.2			2.5		
Barium (Total)	mg/kg	54,000	NA	120		J	85		J	140		J
Beryllium (Total)	mg/kg	1,500	NA	0.9			0.81			0.64		
Cadmium (Total)	mg/kg	370	0.99	0.42			0.34			0.48		
Chromium (Total)	mg/kg	1,000,000	43.4	18			18			15		
Chromium, Hexavalent	mg/kg	300	NA	3.2	J	UJ	2.4	J	UJ	1.5	U	UJ
Cobalt (Total)	mg/kg	9,000	50	20			13			12		
Copper (Total)	mg/kg	31,000	31.6	26			20			20		
Lead (Total)	mg/kg	4,000	35.8	61			110			65		
Mercury (Total)	mg/kg	230	0.174	0.074		U	0.073		U	0.05	J	U
Nickel (Total)	mg/kg	16,000	22.7	36			29			20		
Selenium (Total)	mg/kg	3,900	NA	0.72		J	0.8		J	0.46		J
Silver (Total)	mg/kg	3,900	0.5	0.19			0.2			0.15		
Thallium (Total)	mg/kg	52	NA	0.16			0.19			0.14		
Vanadium (Total)	mg/kg	780	NA	19			19			20		
Zinc (Total)	mg/kg	230,000	121	250			220			340		

J - The associated numerical value is an estimated quantity.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 49
SURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		Human Health Target Decision Level	Ecological Target Decision Level	5-10-CS-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-CS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-CS-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-CS- DUP	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-DS-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.72	mg/kg	410	0.142	0.72			0.46			0.51			0.46			0.57		
Arsenic (Total)	3.2	mg/kg	1.6	5.7	2.7		J-	3.1		J-	2.8		J-	3.2		J-	2.6		J-
Barium (Total)	420	mg/kg	67,000	1.04	420			200			420			150			120		
Beryllium (Total)	0.84	mg/kg	1,900	1.06	0.47			0.84			0.64			0.59			0.77		
Cadmium (Total)	0.56	mg/kg	450	0.0022	0.37			0.42			0.56			0.37			0.18		
Chromium (Total)	21	mg/kg	100,000	0.4	17		J	16		J	21		J	15		J	20		J
Chromium, Hexavalent	2.5	mg/kg	64	NA	1.1	J	J	1.9	U	UJ	2.5	U	UJ	0.4	J	J	0.3	J	J
Cobalt (Total)	29	mg/kg	1,900	0.14	16		J	29		J	23		J	28		J	14		J
Copper (Total)	35	mg/kg	41,000	5.4	35		J-	20		J-	20		J-	18		J-	22		J-
Lead (Total)	70	mg/kg	800	0.0537	70			56			55			57			38		
Mercury (Total)	0.018	mg/kg	310	0.1	0.0079	J	J	0.014	J	J	0.01	J	J	0.013	J	J	0.018	J	J
Nickel (Total)	4	mg/kg	20,000	13.6	14		J	23		J	23		J	19		J	24		J
Selenium (Total)	0.59	mg/kg	5,100	0.0276	0.22		J-	0.54		J-	0.59		J-	0.48		J-	0.54		J-
Silver (Total)	1.1	mg/kg	5,100	4.04	1.1			0.43			0.83			0.34			0.34		
Thallium (Total)	0.15	mg/kg	67	0.0569	0.096	J	J	0.14			0.13			0.12			0.15		
Vanadium (Total)	19	mg/kg	1,000	1.59	12		J	18		J	19		J	16		J	19		J
Zinc (Total)	760	mg/kg	100,000	6.62	760	B	J	240	B	J	530	B	J	200	B	J	160	B	J

Shading indicates the maximum concentration of each COPI.

J - The associated numerical value is an estimated quantity.

J- - The associated numerical value is an estimated quantity, potentially biased low.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

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TABLE 50
SUBSURFACE WASTE CHARACTERIZATION SAMPLES
AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

	Maximum Concentration		5-10-SB-2- Comp	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	0.28	mg/kg	0.28		J+
Arsenic (Total)	2.1	mg/kg	2.1		
Barium (Total)	2600	mg/kg	2600		
Beryllium (Total)	0.7	mg/kg	0.7		
Cadmium (Total)	0.12	mg/kg	0.12		
Chromium (Total)	13	mg/kg	13		J+
Chromium, Hexavalent	ND	mg/kg	2	U	UJ
Cobalt (Total)	20	mg/kg	20		
Copper (Total)	20	mg/kg	20		J
Lead (Total)	71	mg/kg	71		
Mercury (Total)	ND	mg/kg	0.05	J	U
Nickel (Total)	16	mg/kg	16		
Selenium (Total)	0.84	mg/kg	0.84		J-
Silver (Total)	0.11	mg/kg	0.11		
Thallium (Total)	0.13	mg/kg	0.13		
Vanadium (Total)	13	mg/kg	13		
Zinc (Total)	300	mg/kg	300		B

Shading indicates the maximum concentration of each COPI.

- J - The associated numerical value is an estimated quantity.
- J+ - The associated numerical value is an estimated quantity, potentially biased high.
- J- - The associated numerical value is an estimated quantity, potentially biased low.
- U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample
- UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
- B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit.
The positive sample result is considered estimated.

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TABLE 51
SUBSURFACE SOIL SAMPLES
AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-10-SB-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SB-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SB-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SB-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SB-2- Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.2		J+	0.44		J+	0.39		J+	0.31		J+	0.43		J+
Arsenic (Total)	mg/kg	1.6	5.7	29	0.16		J+	8.8			7.2			4.7			7.9		
Barium (Total)	mg/kg	67,000	1.04	1,600	80			110			73			120			77		
Beryllium (Total)	mg/kg	1,900	1.06	63	0.62			0.93			0.91			1.1			1.1		
Cadmium (Total)	mg/kg	450	0.0022	8	0.032	J	J	0.16			0.088			0.18			0.098		
Chromium (Total)	mg/kg	100,000	0.4	38	5.7		J+	17			15			16			17		
Chromium, Hexavalent	mg/kg	64	NA	38	1.8	U	UJ	1.4	J	J	0.22	J	J	0.12	J	J	0.53	J	J
Cobalt (Total)	mg/kg	1,900	0.14	NONE	3.8			12			15			16			15		
Copper (Total)	mg/kg	41,000	5.4	NONE	17		J	21		J	22		J	26		J	23		J
Lead (Total)	mg/kg	800	0.0537	NONE	19			13			13			17			13		
Mercury (Total)	mg/kg	310	0.1	NONE	0.05		J+	0.052		J+	0.05	J	U	0.05	J	U	0.05	J	U
Nickel (Total)	mg/kg	20,000	13.6	130	13			33			24			28			23		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.4		J-	0.77		J-	0.5		J-	0.43		J-	0.46		J-
Silver (Total)	mg/kg	5,100	4.04	34	0.098	J	J	0.12			0.065	J	J	0.072	J	J	0.072	J	J
Thallium (Total)	mg/kg	67	0.0569	NONE	0.12			0.17			0.18			0.18			0.15		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	5.6		J+	24			25			18			27		
Zinc (Total)	mg/kg	100,000	6.62	12,000	26	B	J	99	B	J	110	B	J	100	B	J	110	B	J

		Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)	5-10-TP-1-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-TP-1-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-TP-2-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-TP-2-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	5	0.33			0.69			0.27			0.19		
Arsenic (Total)	mg/kg	1.6	5.7	29	4			7.5			0.34			1.7		
Barium (Total)	mg/kg	67,000	1.04	1,600	78		J	170		J	67		J	78		J
Beryllium (Total)	mg/kg	1,900	1.06	63	0.8			0.99			0.58			0.63		
Cadmium (Total)	mg/kg	450	0.0022	8	0.064			0.16			0.049	J	J	0.068		
Chromium (Total)	mg/kg	100,000	0.4	38	14		J	13		J	5.2		J	8.5		J
Chromium, Hexavalent	mg/kg	64	NA	38	1.4	U	U	1.6	U	U	1.8	U	U	1.9	U	U
Cobalt (Total)	mg/kg	1,900	0.14	NONE	11			8.2			7.3			8.6		
Copper (Total)	mg/kg	41,000	5.4	NONE	23			20			20			22		
Lead (Total)	mg/kg	800	0.0537	NONE	16		J	20		J	17		J	19		J
Mercury (Total)	mg/kg	310	0.1	NONE	0.049	J	J	0.11			0.037	J	J	0.038	J	J
Nickel (Total)	mg/kg	20,000	13.6	130	21			33			12			16		
Selenium (Total)	mg/kg	5,100	0.0276	5	0.61			0.82			0.42			0.58		
Silver (Total)	mg/kg	5,100	4.04	34	0.067	J	J	0.17			0.059	J		0.054	J	J
Thallium (Total)	mg/kg	67	0.0569	NONE	0.14			0.31			0.12			0.13		
Vanadium (Total)	mg/kg	1,000	1.59	6,000	16			16			5.6			8.4		
Zinc (Total)	mg/kg	100,000	6.62	12,000	56			57			21			40		

J - The associated numerical value is an estimated quantity.
J+ - The associated numerical value is an estimated quantity, potentially biased high.
J- - The associated numerical value is an estimated quantity, potentially biased low.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered
Bold text indicates that value exceeds the applicable Ecological Target Decision Level.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.
Underlined text indicates that value exceeds the applicable Soil Screening Level.

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TABLE 52
SURFACE WATER SAMPLES
AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-10-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SW-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.0036			0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.093			0.052			0.002		
Barium (Total)	mg/L	20	0.22	6			7.8			0.38		
Beryllium (Total)	mg/L	0.28	0.0036	0.011			0.009			0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.019			0.0067			0.0002	U	U
Chromium (Total)	mg/L	1.0	0.086	0.34			0.19			0.0056		J+
Chromium, Hexavalent	mg/L	1.0	0.011	0.005	U	U	0.005	U	U	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	1.6			0.6			0.003		
Copper (Total)	mg/L	1.3	0.0093	0.33			0.7			0.017		
Lead (Total)	mg/L	0.15	0.0064	1.1			0.48			0.008		
Mercury (Total)	mg/L	0.000012	0.00091	<i>0.00069</i>			<i>0.000089</i>	J	J	0.0002*	U	U
Nickel (Total)	mg/L	4.6	0.052	0.46		R	0.3			0.0056		
Selenium (Total)	mg/L	11.0	0.005	0.023			0.0088			0.00073	J	J
Silver (Total)	mg/L	1.0	0.00012	0.0043			0.0025			0.00012	J	J
Thallium (Total)	mg/L	0.0063	0.01	0.0022			0.0016			0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.43			0.23			0.0071		
Zinc (Total)	mg/L	69.0	0.12	25	B	J	7.1	B	J	0.066	B	J
Hardness as CaCO3	mg/L			38			22			420		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

R - The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 53
SEDIMENT SAMPLES
AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-10-SED-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SED-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SED-3	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	1.1			0.41		J+	0.31		J+
Arsenic (Total)	mg/kg	3.9	9.79	2.8			3.3			1.7		
Barium (Total)	mg/kg	54,000	NA	270		J	190			170		
Beryllium (Total)	mg/kg	1,500	NA	0.43			0.76			0.76		
Cadmium (Total)	mg/kg	370	0.99	0.62			0.4			0.35		
Chromium (Total)	mg/kg	1,000,000	43.4	16			19			14		J+
Chromium, Hexavalent	mg/kg	300	NA	2.7	U	UJ	1.7	U	UJ	1.9	U	UJ
Cobalt (Total)	mg/kg	9,000	50	42			23			14		
Copper (Total)	mg/kg	31,000	31.6	18			22		J	27		J
Lead (Total)	mg/kg	4,000	35.8	34			44			37		
Mercury (Total)	mg/kg	230	0.174	0.05	J	U	0.05	J	U	0.05	J	U
Nickel (Total)	mg/kg	16,000	22.7	15			24			22		
Selenium (Total)	mg/kg	3,900	NA	0.43		J	0.6			0.88		
Silver (Total)	mg/kg	3,900	0.5	0.27			0.23			0.14		
Thallium (Total)	mg/kg	52	NA	0.094	J	J	0.17			0.13		
Vanadium (Total)	mg/kg	780	NA	16			20			14		
Zinc (Total)	mg/kg	230,000	121	770			270			410		

J - The associated numerical value is an estimated quantity.

J+ - The associated numerical value is an estimated quantity, potentially biased high.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 54
SEEP SAMPLES
AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-10-SEEP-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SEEP-1 (Conf. Sample 8/9/06)	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U	NA		NA
Arsenic (Total)	mg/L	0.1	0.15	0.0011			NA		NA
Barium (Total)	mg/L	20	0.22	0.15		J-	NA		NA
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U	NA		NA
Cadmium (Total)	mg/L	0.05	0.0025	0.00039			NA		NA
Chromium (Total)	mg/L	1.0	0.086	0.001			NA		NA
Chromium, Hexavalent-Dissolved	mg/L	1.0	0.011	0.005	U	U	NA		NA
Cobalt (Total)	mg/L	NA	0.024	0.13		J-	NA		NA
Copper (Total)	mg/L	1.3	0.0093	0.0026			NA		NA
Lead (Total)	mg/L	0.15	0.0084	0.0016			NA		NA
Mercury (Total)	mg/L	0.00012	0.00091	0.0002*	U	U	NA		NA
Nickel (Total)	mg/L	4.6	0.052	0.0016			NA		NA
Selenium (Total)	mg/L	11.0	0.005	0.0014			NA		NA
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U	NA		NA
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U	NA		NA
Vanadium (Total)	mg/L	NA	0.012	0.0031			NA		NA
Zinc (Total)	mg/L	69.0	0.12	0.18	B	J	NA		NA
1,1,1-Trichloroethane	mg/L	2	0.076	0.001	U	UJ	0.001	U	UJ
1,1,2,2-Tetrachloroethane	mg/L	NA	0.38	0.001	U	UJ	0.001	U	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
1,1,2-Trichloroethane	mg/L	0.05	0.5	0.001	U	UJ	0.001	U	UJ
1,1-Dichloroethane	mg/L	NA	0.047	0.001	U	UJ	0.001	U	UJ
1,1-Dichloroethene	mg/L	0.07	0.065	0.001	U	UJ	0.001	U	UJ
1,2,4-Trichlorobenzene	mg/L	0.7	0.03	0.001	U	UJ	0.001	U	UJ
1,2-Dibromo-3-chloropropane	mg/L	0.002	NA	0.001	U	UJ	0.001	U	UJ
1,2-Dibromoethane	mg/L	0.0005	NA	0.001*	U	UJ	0.001*	U	UJ
1,2-Dichlorobenzene	mg/L	6	0.014	0.001	U	UJ	0.001	U	UJ
1,2-Dichloroethane	mg/L	0.05	0.91	0.001	U	UJ	0.001	U	UJ
1,2-Dichloropropane	mg/L	0.05	0.36	0.001	U	UJ	0.001	U	UJ
1,3-Dichlorobenzene	mg/L	NA	0.038	0.001	U	UJ	0.001	U	UJ
1,4-Dichlorobenzene	mg/L	0.75	0.0094	0.001	U	UJ	0.001	U	UJ
2-Butanone (MEK)	mg/L	NA	2.2	0.005	U	UJ	0.005	U	UJ
2-Hexanone	mg/L	NA	0.099	0.005	U	UJ	0.005	U	UJ
4-Methyl-2-pentanone (MIBK)	mg/L	NA	0.17	0.005	U	UJ	0.005	U	UJ
Acetone	mg/L	NA	1.7	0.0012	J	J	0.005	U	UJ
Benzene	mg/L	0.05	0.114	0.001	U	UJ	0.001	U	UJ
Bromodichloromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Bromoform	mg/L	NA	0.23	0.001	U	UJ	0.001	U	UJ
Bromomethane	mg/L	NA	0.016	0.001	U	UJ	0.001	U	UJ
Carbon Disulfide	mg/L	NA	0.015	0.005	J	UJ	0.005	U	UJ
Carbon Tetrachloride	mg/L	NA	0.24	0.001	U	UJ	0.001	U	UJ
Chlorobenzene	mg/L	1	0.047	0.001	U	UJ	0.001	U	UJ
Chloroethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Chloroform	mg/L	NA	0.14	0.0005	J	J	0.001	U	UJ
Chloromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
cis-1,2-Dichloroethene	mg/L	0.7	NA	0.001	U	UJ	0.001	U	UJ
cis-1,3-Dichloropropene	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Cyclohexane	mg/L	NA	NA	0.005	U	UJ	0.005	U	UJ
Dibromochloromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Dichlorodifluoromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Ethylbenzene	mg/L	7	0.014	0.001	U	UJ	0.001	U	UJ
Isopropylbenzene (Cumene)	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Methyl Acetate	mg/L	NA	NA	0.005	U	UJ	0.005	U	UJ
Methyl tert-Butyl Ether (MTBE)	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Methylcyclohexane	mg/L	NA	NA	0.005	U	UJ	0.005	U	UJ
Methylene Chloride	mg/L	0.05	0.94	0.001	J	UJ	0.001	U	UJ
Styrene	mg/L	1	0.032	0.001	U	UJ	0.001	U	UJ
Tetrachloroethene	mg/L	0.05	0.045	0.001	U	UJ	0.001	U	UJ
Toluene	mg/L	10	0.253	0.001	U	UJ	0.001	U	UJ
trans-1,2-Dichloroethene	mg/L	1	0.97	0.001	U	UJ	0.001	U	UJ
trans-1,3-Dichloropropene	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Trichloroethene	mg/L	0.05	0.047	0.001	U	UJ	0.001	U	UJ
Trichlorofluoromethane	mg/L	NA	NA	0.001	U	UJ	0.001	U	UJ
Vinyl Chloride	mg/L	0.02	0.93	0.001	U	UJ	0.001	U	UJ
Xylene (Total)	mg/L	100	0.027	0.003	U	UJ	0.003	U	UJ

J - The associated numerical value is an estimated quantity.

J- - The associated numerical value is an estimated quantity, potentially biased low.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 55
SOIL ASSOCIATED WITH SEEP SAMPLES
AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	5-10-SEEP-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-10-SEEP-1 (Conf. Sample 8/9/06)	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	410	0.142	0.54			NA		
Arsenic (Total)	mg/kg	1.6	5.7	8.6			NA		
Barium (Total)	mg/kg	67,000	1.04	260		J	NA		
Beryllium (Total)	mg/kg	1,900	1.06	0.69			NA		
Cadmium (Total)	mg/kg	450	0.0022	0.4			NA		
Chromium (Total)	mg/kg	100,000	0.4	14		J	NA		
Chromium, Hexavalent	mg/kg	64	NA	4	U	UU	NA		
Cobalt (Total)	mg/kg	1,900	0.14	15			NA		
Copper (Total)	mg/kg	41,000	5.4	21			NA		
Lead (Total)	mg/kg	800	0.0537	120		J	NA		
Mercury (Total)	mg/kg	310	0.1	0.034	J	J	NA		
Nickel (Total)	mg/kg	20,000	13.6	19			NA		
Selenium (Total)	mg/kg	5,100	0.0276	0.59			NA		
Silver (Total)	mg/kg	5,100	4.04	0.38			NA		
Thallium (Total)	mg/kg	67	0.0569	0.15			NA		
Vanadium (Total)	mg/kg	1,000	1.59	23			NA		
Zinc (Total)	mg/kg	100,000	6.62	1100			NA		
1,1,1-Trichloroethane	mg/kg	1200	29.8	0.002	U	UU	0.001	U	UU
1,1,2,2-Tetrachloroethane	mg/kg	0.93	0.127	0.002	U	UU	0.001	U	UU
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	5600	NA	0.002	U	UU	0.001	U	UU
1,1,2-Trichloroethane	mg/kg	1.6	28.6	0.002	U	UU	0.001	U	UU
1,1-Dichloroethane	mg/kg	1700	20.1	0.002	U	UU	0.001	U	UU
1,1-Dichloroethene	mg/kg	410	8.28	0.002	U	UU	0.001	U	UU
1,2,4-Trichlorobenzene	mg/kg	220	11.1	0.002	U	UU	0.001	U	UU
1,2-Dibromo-3-chloropropane	mg/kg	2	0.0352	0.01	U	UU	0.005	U	UU
1,2-Dibromoethane	mg/kg	0.073	1.23	0.002	U	UU	0.001	U	UU
1,2-Dichlorobenzene	mg/kg	600	2.96	0.002	U	UU	0.001	U	UU
1,2-Dichloroethane	mg/kg	0.6	21.2	0.002	U	UU	0.001	U	UU
1,2-Dichloropropane	mg/kg	0.74	32.7	0.002	U	UU	0.001	U	UU
1,3-Dichlorobenzene	mg/kg	600	37.7	0.002	U	UU	0.001	U	UU
1,4-Dichlorobenzene	mg/kg	7.9	0.546	0.002	U	UU	0.001	U	UU
2-Butanone (MEK)	mg/kg	110000	89.6	0.02		J	0.0068		J
2-Hexanone	mg/kg	NA	12.6	0.01	U	UU	0.005	U	UU
4-Methyl-2-pentanone (MIBK)	mg/kg	47000	443	0.01	U	UU	0.005	U	UU
Acetone	mg/kg	54000	2.5	0.19		J	0.029		J
Benzene	mg/kg	1.4	0.255	0.002	U	UU	0.00029	J	J
Bromodichloromethane	mg/kg	1.8	0.54	0.002	U	UU	0.001	U	UU
Bromoform	mg/kg	220	15.9	0.002	U	UU	0.001	U	UU
Bromomethane	mg/kg	13	0.235	0.002	U	UU	0.001	U	UU
Carbon Disulfide	mg/kg	720	0.0941	0.31		J	0.0046		J
Carbon Tetrachloride	mg/kg	0.55	2.98	0.002	U	UU	0.001	U	UU
Chlorobenzene	mg/kg	530	13.1	0.002	U	UU	0.001	U	UU
Chloroethane	mg/kg	6.5	NA	0.002	U	UU	0.001	U	UU
Chloroform	mg/kg	0.47	1.19	0.002	U	UU	0.001	U	UU
Chloromethane	mg/kg	160	10.4	0.002	U	UU	0.001	U	UU
cis-1,2-Dichloroethene	mg/kg	150	NA	0.002	U	UU	0.001	U	UU
cis-1,3-Dichloropropene	mg/kg	1.8	0.398	0.002	U	UU	0.001	U	UU
Cyclohexane	mg/kg	140	NA	0.01	U	UU	0.005	U	UU
Dibromochloromethane	mg/kg	2.6	22.05	0.002	U	UU	0.001	U	UU
Dichlorodifluoromethane	mg/kg	310	39.5	0.002	U	UU	0.001	U	UU
Ethylbenzene	mg/kg	400	5.16	0.002	U	UU	0.001	U	UU
Isopropylbenzene (Cumene)	mg/kg	2000	NA	0.002	U	UU	0.001	U	UU
Methyl Acetate	mg/kg	92000	NA	0.01	U	UU	0.005	U	UU
Methyl tert-Butyl Ether (MTBE)	mg/kg	70	NA	0.002	U	UU	0.001	U	UU
Methylcyclohexane	mg/kg	8700	NA	0.01	U	UU	0.005	U	UU
Methylene Chloride	mg/kg	21	4.05	0.01	U	UU	0.005	U	UU
Styrene	mg/kg	1700	4.69	0.002	U	UU	0.001	U	UU
Tetrachloroethene	mg/kg	1.3	9.92	0.002	U	UU	0.001	U	UU
Toluene	mg/kg	520	5.45	0.0009	J	J	0.001	U	UU
trans-1,2-Dichloroethene	mg/kg	230	0.784	0.002	U	UU	0.001	U	UU
trans-1,3-Dichloropropene	mg/kg	1.8	0.398	0.002	U	UU	0.001	U	UU
Trichloroethene	mg/kg	0.11	12.4	0.002	U	UU	0.001	U	UU
Trichlorofluoromethane	mg/kg	2000	16.4	0.002	U	UU	0.001	U	UU
Vinyl Chloride	mg/kg	0.75	0.646	0.002	U	UU	0.001	U	UU
Xylene (Total)	mg/kg	420	10	0.006	U	UU	0.003	U	UU

J - The associated numerical value is an estimated quantity.

U - The associated numerical value is an estimated quantity, potentially biased low.

UU - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

UU - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicized text indicates that value exceeds the applicable Human Health Target Decision Level.

NA - Not analyzed for this chemical

TABLE 56
SURFACE WATER SAMPLES
AREA NORTHWEST OF AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	ADD-SW-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	4.3	0.08	0.001	U	U
Arsenic (Total)	mg/L	0.1	0.15	0.00087	J	J
Barium (Total)	mg/L	20	0.22	0.063		J-
Beryllium (Total)	mg/L	0.28	0.0036	0.001	U	U
Cadmium (Total)	mg/L	0.05	0.0025	0.00015	J	J
Chromium (Total)	mg/L	1.0	0.086	0.0014		
Chromium, Hexavalent	mg/L	1.0	0.011	0.005	U	U
Cobalt (Total)	mg/L	NA	0.024	0.0011		J-
Copper (Total)	mg/L	1.3	0.0093	0.0029		
Lead (Total)	mg/L	0.15	0.0064	0.0029		
Mercury (Total)	mg/L	0.000012	0.00091	0.0002*	U	U
Nickel (Total)	mg/L	4.6	0.052	0.0029		
Selenium (Total)	mg/L	11.0	0.005	0.001	U	U
Silver (Total)	mg/L	1.0	0.00012	0.0002*	U	U
Thallium (Total)	mg/L	0.0063	0.01	0.001	U	U
Vanadium (Total)	mg/L	NA	0.012	0.0022		
Zinc (Total)	mg/L	69.0	0.12	0.061	B	J
Hardness as CaCO3	mg/L			160		J

J - The associated numerical value is an estimated quantity.

J- - The associated numerical value is an estimated quantity, potentially biased low.

U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

*Laboratory detection limit exceeds Target Decision Level.

TABLE 57
SEDIMENT SAMPLES
AREA NORTHWEST OF AOI 5-10
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	Ecological Target Decision Level	ADD-SED-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/kg	310	NA	0.52		
Arsenic (Total)	mg/kg	3.9	9.79	6.1		
Barium (Total)	mg/kg	54,000	NA	170		J
Beryllium (Total)	mg/kg	1,500	NA	0.69		
Cadmium (Total)	mg/kg	370	0.99	0.48		
Chromium (Total)	mg/kg	1,000,000	43.4	21		
Chromium, Hexavalent	mg/kg	300	NA	16		J
Cobalt (Total)	mg/kg	9,000	50	15		
Copper (Total)	mg/kg	31,000	31.6	23		
Lead (Total)	mg/kg	4,000	35.8	53		J
Mercury (Total)	mg/kg	230	0.174	0.069		
Nickel (Total)	mg/kg	16,000	22.7	23		
Selenium (Total)	mg/kg	3,900	NA	0.63		
Silver (Total)	mg/kg	3,900	0.5	0.13		
Thallium (Total)	mg/kg	52	NA	0.18		
Vanadium (Total)	mg/kg	780	NA	20		
Zinc (Total)	mg/kg	230,000	121	400	B	J

J - The associated numerical value is an estimated quantity.

B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.

Bold text indicates that value exceeds the applicable Ecological Target Decision Level.

Italicised text indicates that value exceeds the applicable Human Health Target Decision Level.

TABLE 58
 TEMPORARY WELL SAMPLING VOC RESULTS
 RCRA FACILITY INVESTIGATION
 LAUFEN INTERNATIONAL
 EAST SPARTA, OHIO

		Human Health Target Decision Level	5-5-Temp Well	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-Temp Well	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-Temp Well	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-Temp Well Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
1,1,1-Trichloroethane	mg/L	0.2	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1,2,2-Tetrachloroethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1,2-Trichloroethane	mg/L	0.005	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1-Dichloroethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,1-Dichloroethene	mg/L	0.007	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2,4-Trichlorobenzene	mg/L	0.07	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2-Dibromo-3-chloropropane	mg/L	0.0002	<i>0.001*</i>	U	UJ	<i>0.001*</i>	U	UJ	<i>0.001*</i>	U	UJ	<i>0.001*</i>	U	UJ
1,2-Dibromoethane	mg/L	0.00005	<i>0.001*</i>	U	UJ	<i>0.001*</i>	U	UJ	<i>0.001*</i>	U	UJ	<i>0.001*</i>	U	UJ
1,2-Dichlorobenzene	mg/L	0.6	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2-Dichloroethane	mg/L	0.005	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,2-Dichloropropane	mg/L	0.005	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,3-Dichlorobenzene	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
1,4-Dichlorobenzene	mg/L	0.075	0.001	U	UJ	0.001	U	UJ	0.006		J	0.0057		J
2-Butanone (MEK)	mg/L	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
2-Hexanone	mg/L	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
4-Methyl-2-pentanone (MIBK)	mg/L	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Acetone	mg/L	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Benzene	mg/L	0.005	0.001	U	UJ	0.001	U	UJ	0.0001	J	J	0.00008	J	J
Bromodichloromethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Bromoform	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Bromomethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Carbon Disulfide	mg/L	NA	0.005	J	UJ	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Carbon Tetrachloride	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Chlorobenzene	mg/L	0.1	0.001	U	UJ	0.001	U	UJ	0.0042		J	0.0041		J
Chloroethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Chloroform	mg/L	NA	0.00018	J	J	0.00017	J	J	0.00018	J	J	0.001	U	UJ
Chloromethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
cis-1,2-Dichloroethene	mg/L	0.07	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
cis-1,3-Dichloropropene	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Cyclohexane	mg/L	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Dibromochloromethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Dichlorodifluoromethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.0013		J	0.0014		J
Ethylbenzene	mg/L	0.7	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Isopropylbenzene (Cumene)	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Methyl Acetate	mg/L	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Methyl tert-Butyl Ether (MTBE)	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Methylcyclohexane	mg/L	NA	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ	0.005	U	UJ
Methylene Chloride	mg/L	0.005	0.001	J	UJ	0.001	J	UJ	0.001	J	UJ	0.001	U	UJ
Styrene	mg/L	0.1	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Tetrachloroethene	mg/L	0.005	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Toluene	mg/L	1	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
trans-1,2-Dichloroethene	mg/L	0.1	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
trans-1,3-Dichloropropene	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Trichloroethene	mg/L	0.005	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Trichlorofluoromethane	mg/L	NA	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Vinyl Chloride	mg/L	0.002	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ	0.001	U	UJ
Xylene (Total)	mg/L	10	0.003	U	UJ	0.003	U	UJ	0.003	U	UJ	0.003	U	UJ

J - The associated numerical value is an estimated quantity.
 U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
 UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level
 *Exceedence is the result of laboratory detection limit exceeding Human Health Target Decision Level

TABLE 59
TEMPORARY WELL SAMPLING INORGANIC RESULTS
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	5-5-Temp Well	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-Temp Well	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-Temp Well	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-9-Temp Well Dup	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	0.006	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.01	0.00053	J	J	0.0015			0.0029			0.0027		
Barium (Total)	mg/L	2	0.3		J-	3.1		J-	0.49		J-	0.49		J-
Beryllium (Total)	mg/L	0.004	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Cadmium (Total)	mg/L	0.005	0.0002			0.0003			0.000069	J	J	0.000068	J	J
Chromium (Total)	mg/L	0.1	0.001	U	U	0.002			0.001	U	U	0.001	U	U
Chromium, Hexavalent (Total)	mg/L	0.1	0.005	U	U	0.005	U	U	0.005	U	U	0.005	J	U
Cobalt (Total)	mg/L	0.73	0.021		J-	0.0049		J-	0.0076		J-	0.0077		J-
Copper (Total)	mg/L	1.3	0.013			0.0067			0.0019			0.0021		
Lead (Total)	mg/L	0.015	0.028			0.016			0.0013			0.0013		
Mercury (Total)	mg/L	0.002	0.0002	J	U	0.0002	J	U	0.0002	J	U	0.0002	U	U
Nickel (Total)	mg/L	0.73	0.0015			0.0078			0.0036			0.0037		
Selenium (Total)	mg/L	0.05	0.001	U	U	0.0024			0.001	U	U	0.001	U	U
Silver (Total)	mg/L	0.1	0.0002	U	U	0.0002	U	U	0.0002	U	U	0.0002	U	U
Thallium (Total)	mg/L	0.002	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Vanadium (Total)	mg/L	0.036	0.0026			0.0058			0.00042	J	J	0.00054	J	J
Zinc (Total)	mg/L	5	0.11	B	J	0.94	B	J	0.085	B	J	0.086	B	J

		Human Health Target Decision Level	5-5-Temp Well-Filtered	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	5-7-Temp Well-Filtered	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Dissolved)	mg/L	0.006	0.001	U	U	0.001	U	U
Arsenic (Dissolved)	mg/L	0.01	0.00061	J	J	0.0016		
Barium (Dissolved)	mg/L	2	0.29		J-	3.2		J-
Beryllium (Dissolved)	mg/L	0.004	0.001	U	U	0.001	U	U
Cadmium (Dissolved)	mg/L	0.005	0.0002	U	U	0.00019	J	J
Chromium (Dissolved)	mg/L	0.1	0.00081	J	J	0.001	U	U
Chromium, Hexavalent (Dissolved)	mg/L	0.1	0.005	U	U	0.005	U	U
Cobalt (Dissolved)	mg/L	0.73	0.02		J-	0.0049		J-
Copper (Dissolved)	mg/L	1.3	0.0013			0.0038		
Lead (Dissolved)	mg/L	0.015	0.0011			0.0033		
Mercury (Dissolved)	mg/L	0.002	0.0002	U	U	0.0002	U	U
Nickel (Dissolved)	mg/L	0.73	0.00091	J	J	0.0068		
Selenium (Dissolved)	mg/L	0.05	0.001	U	U	0.0018		
Silver (Dissolved)	mg/L	0.1	0.0002	U	U	0.0002	U	U
Thallium (Dissolved)	mg/L	0.002	0.001	U	U	0.001	U	U
Vanadium (Dissolved)	mg/L	0.036	0.0019			0.0028		
Zinc (Dissolved)	mg/L	5	0.028	B	J	0.83	B	J

J - The associated numerical value is an estimated quantity.
J- - The associated numerical value is an estimated quantity, potentially biased low.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is considered estimated.
Italicised text indicates that value exceeds the applicable Human Health Target Decision Level

TABLE 60
MONITORING WELL SAMPLING RESULTS
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

		Human Health Target Decision Level	PZ-1	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	PZ-1D	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	PZ-2- Unfiltered	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	PZ-3- Unfiltered	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	PZ-4	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	TW-2	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	TW-3- Unfiltered	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Total)	mg/L	0.006	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Total)	mg/L	0.01	0.0007	J	J	0.00084	J	J	0.0014			0.002			0.001	U	U	0.001	U	U	0.0015		
Barium (Total)	mg/L	2	0.029			0.028			0.052			0.042			0.54			0.055			0.064		
Beryllium (Total)	mg/L	0.004	0.0016			0.0016			0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Cadmium (Total)	mg/L	0.005	0.00026			0.00025			0.00014	J	J	0.00011	J	J	0.0002	U	U	0.0002	U	U	0.0031		
Chromium (Total)	mg/L	0.1	0.00068	J	J	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Cobalt (Total)	mg/L	0.73	0.034			0.035			0.052			0.028			0.0018			0.00047	J	J	0.0017		
Copper (Total)	mg/L	1.3	0.0024			0.003			0.00053	J	J	0.001			0.0016			0.0015			0.0011		
Lead (Total)	mg/L	0.015	0.00075	J	J	0.0007			0.001	U	U	0.00032	J	J	0.001	U	U	0.0003	J	J	0.00081	J	J
Mercury (Total)	mg/L	0.002	0.0002	J	U	0.0002	J	U	0.0002	J	U	0.0002	J	U	0.0002	J	U	0.0002	J	U	0.0002	J	U
Nickel (Total)	mg/L	0.73	0.091			0.093	J	J	0.025			0.014			0.0031			0.001	U	U	0.018		
Selenium (Total)	mg/L	0.05	0.001	U	U	0.001			0.001	U	UJ	0.001	U	UJ	0.001	U	U	0.001	U	U	0.001	U	U
Silver (Total)	mg/L	0.1	0.0002	U	U	0.0002	U	U	0.0002	U	U	0.0002	U	U	0.0002	U	U	0.0002	U	U	0.0002	U	U
Thallium (Total)	mg/L	0.002	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U	0.001	U	U
Vanadium (Total)	mg/L	0.036	0.00063	J	J	0.0004	U	U	0.001	U	U	0.00044	J	J	0.00028	J	J	0.0004	J	J	0.001	U	U
Zinc (Total)	mg/L	5	0.11			0.11	J	J	0.023		J+	0.013	B	J+	0.007	B	J+	0.013	B	J+	1.2		

		Human Health Target Decision Level	PZ-2- Filtered	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	PZ-3- Filtered	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag	TW-3- Filtered	Lab Data Qualifier Flag	Data Validator Data Qualifier Flag
Antimony (Dissolved)	mg/L	0.006	0.001	U	U	0.001	U	U	0.001	U	U
Arsenic (Dissolved)	mg/L	0.01	0.0014			0.002			0.00098	J	J
Barium (Dissolved)	mg/L	2	0.051			0.038			0.061		
Beryllium (Dissolved)	mg/L	0.004	0.001	U	U	0.001	U	U	0.001	U	U
Cadmium (Dissolved)	mg/L	0.005	0.00011	J	J	0.0001	J	J	0.0027		
Chromium (Dissolved)	mg/L	0.1	0.001	U	U	0.001	U	U	0.001	U	U
Cobalt (Dissolved)	mg/L	0.73	0.051			0.027			0.0015		
Copper (Dissolved)	mg/L	1.3	0.00048	J	J	0.00051	J	J	0.00084	J	J
Lead (Dissolved)	mg/L	0.015	0.00026	J	J	0.001	U	U	0.001	U	U
Mercury (Dissolved)	mg/L	0.002	0.0002	J	U	0.0002	J	U	0.0002	J	U
Nickel (Dissolved)	mg/L	0.73	0.024			0.014			0.018		
Selenium (Dissolved)	mg/L	0.05	0.001	U	UJ	0.00086	J	J-	0.001	U	U
Silver (Dissolved)	mg/L	0.1	0.0002	U	U	0.0002	U	U	0.0002	U	U
Thallium (Dissolved)	mg/L	0.002	0.001	U	U	0.001	U	U	0.001	U	U
Vanadium (Dissolved)	mg/L	0.036	0.001	U	U	0.001	U	U	0.001	U	U
Zinc (Dissolved)	mg/L	5	0.028		J+	0.015	B	J+	1.1		

- J - The associated numerical value is an estimated quantity.
J+ - The associated numerical value is an estimated quantity, potentially biased high.
J- - The associated numerical value is an estimated quantity, potentially biased low.
U - The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ - The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.
B - The analyte concentration in the associated method blank was greater than or equal to the reporting limit. The positive sample result is

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TABLE 61
LAUFEN INTERNATIONAL
PHASE I RCRA FACILITY INVESTIGATION
COPI EXCEEDENCE SUMMARY

COPI Exceeding Any Target Decision Levels	COPI <u>Not</u> Exceeding Any Target Decision Levels
Antimony (Total)	1,1,1-Trichloroethane
Arsenic (Total)	1,1,2-Trichloro-1,2,2-trifluoroethane
Barium (Total)	1,1,2-Trichloroethane
Beryllium (Total)	1,1-Dichloroethane
Cadmium (Total)	1,1-Dichloroethene
Chromium (Total)	1,2,4-Trichlorobenzene
Cobalt (Total)	1,2-Dichlorobenzene
Copper (Total)	1,2-Dichloroethane
Lead (Total)	1,2-Dichloropropane
Mercury (Total)	1,3-Dichlorobenzene
Nickel (Total)	1,4-Dichlorobenzene
Percent Solids	2-Butanone (MEK)
Selenium (Total)	2-Hexanone
Silver (Total)	4-Methyl-2-pentanone (MIBK)
Thallium (Total)	Acetone
Vanadium (Total)	Benzene
Zinc (Total)	Bromodichloromethane
	Bromoform
1,2-Dibromoethane*	Bromomethane
1,2-Dibromo-3-chloropropane*	Carbon Tetrachloride
Carbon Disulfide**	Chlorobenzene
	Chloroethane
	Chloroform
	Chloromethane
	cis-1,2-Dichloroethene
	cis-1,3-Dichloropropene
	Cyclohexane
	Dibromochloromethane
	Dichlorodifluoromethane
	Ethylbenzene
	Isopropylbenzene (Cumene)
	Methyl Acetate
	Methyl tert-Butyl Ether (MTBE)
	Methylcyclohexane
	Methylene Chloride
	Styrene
	Tetrachloroethene
	Toluene
	trans-1,2-Dichloroethene
	trans-1,3-Dichloropropene
	Trichloroethene
	Trichlorofluoromethane
	Vinyl Chloride
	Xylene (Total)
	Hexavalent Chromium

* Exceedences were the result of laboratory detection limits exceeding the applicable Target Decision Level

** Exceedence was not duplicated upon re-sampling and analysis

TABLE 62
SUMMARY OF TARGET DECISION LEVEL EXCEEDENCES
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

AOI	Sample Type	Total No. of Samples	Number of Exceedences		
			Human Health Target Decision Level	Ecological Target Decision Level	Soil Screening Levels (Migration to Groundwater)
5-1	Surficial Fill/Waste Materials	10	9	10	N/A
	Release Surface Soil	5	5	5	N/A
	Release Subsurface Soil	9	7	9	1
	Surface Water	3	3	3	N/A
	Sediment	3	1	3	N/A
5-3	Surficial Fill/Waste Materials	7	7	7	N/A
	Release Surface Soil	5	5	5	N/A
	Release Subsurface Soil	6	4	6	0
	Surface Water	6	6	6	N/A
	Sediment	6	1	2	N/A
5-4	Surficial Fill/Waste Materials	19	10	19	N/A
	Release Surface Soil	6	5	6	N/A
	Release Subsurface Soil	12	10	12	0
	Surface Water	5	5	5	N/A
	Sediment	4	3	4	N/A
5-5	Surficial Fill/Waste Materials	10	5	10	N/A
	Release Surface Soil	3	2	3	N/A
	Release Subsurface Soil	6	6	6	0
	Surface Water	2	2	2	N/A
	Sediment	2	2	2	N/A
	Seep Water	1	1	1	N/A
	Seep Soil	1	1	1	N/A
5-6	Surficial Fill/Waste Materials	9	4	9	N/A
	Release Surface Soil	4	4	4	N/A
	Release Subsurface Soil	7	7	7	0
	Surface Water	2	2	2	N/A
	Sediment	2	0	2	N/A
5-7	Surficial Fill/Waste Materials	13	8	13	N/A
	Release Surface Soil	3	3	3	N/A
	Release Subsurface Soil	8	7	8	3
	Surface Water	4	4	4	N/A
	Sediment	4	2	3	N/A
	Seep Water	3	3	3	N/A
	Seep Soil	3	3	3	N/A
5-9	Surficial Fill/Waste Materials	5	3	5	N/A
	Release Surface Soil	2	2	2	N/A
	Release Subsurface Soil	5	5	5	1
	Surface Water	3	3	3	N/A
	Sediment	3	0	3	N/A
5-10	Surficial Fill/Waste Materials	5	5	5	N/A
	Release Surface Soil	0	-	-	N/A
	Release Subsurface Soil	9	7	9	0
	Surface Water	3	3	3	N/A
	Sediment	3	0	3	N/A
	Seep Water	1	1	1	N/A
	Seep Soil	1	1	1	N/A
ADD	Surface Water	1	1	1	N/A
	Sediment	1	1	1	N/A

TABLE 63
HUMAN HEALTH TARGET DECISION LEVEL EXCEEDENCE SUMMARY
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

FILL/WASTE									
	5-1	5-3	5-4	5-5	5-6	5-7	5-9	5-10	Add
Surface Fill/Waste									
Arsenic	9/10	7/7	10/19	5/10	4/9	8/13	3/5	5/5	-
Lead	2/10			5/10					-

SOIL									
	5-1	5-3	5-4	5-5	5-6	5-7	5-9	5-10	Add
Surface Soil									
Arsenic	5/5	5/5	5/6	2/3	4/4	3/3	2/2	-	-
Subsurface Soil									
Arsenic	7/9	4/6	10/12	6/6	7/7	7/8	5/5	7/9	-
Sediment					0/2		0/3	0/3	
Arsenic	1/3	1/6	3/4	2/2		2/4			1/1
Seeps									
Arsenic	-	-	-	1/1	-	3/3	-	1/1	-

SURFACE WATER									
	5-1	5-3	5-4	5-5	5-6	5-7	5-9	5-10	Add
Seeps									
Mercury	-	-	-	1/1	-	3/3*	-	1/1*	-
1,2-Dibromoethane*	-	-	-	1/1	-	3/3*	-	1/1*	-
Surface Water									
Mercury	3/3	6/6	5/5	2/2	2/2*	4/4*	3/3*	3/3	1/1*
Lead				1/2				2/3	

*Exceedence is the result of laboratory detection limit exceeding Target Decision Level.

TABLE 64
ECOLOGICAL TARGET DECISION LEVEL EXCEEDENCE SUMMARY
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

SURFICIAL FILL/WASTE									
	5-1	5-3	5-4	5-5	5-6	5-7	5-9	5-10	Add
Surface Soil									
Antimony	10/10	7/7	14/19	10/10	9/9	12/13	5/5	5/5	-
Arsenic	0/10	2/7	0/19	2/10	0/9	2/13	1/5	0/5	-
Barium	10/10	7/7	19/19	10/10	9/9	13/13	5/5	5/5	-
Beryllium	0/10	0/7	0/19	0/10	0/9	0/13	0/5	0/5	-
Cadmium	10/10	7/7	19/19	10/10	9/9	13/13	5/5	5/5	-
Chromium	10/10	7/7	19/19	10/10	9/9	13/13	5/5	5/5	-
Cobalt	10/10	7/7	19/19	10/10	9/9	13/13	5/5	5/5	-
Copper	10/10	7/7	17/19	10/10	8/9	13/13	3/5	5/5	-
Lead	10/10	7/7	19/19	10/10	9/9	13/13	5/5	5/5	-
Mercury	3/10	0/7	1/19	2/10	0/9	1/13	0/5	0/5	-
Nickel	1/10	4/7	13/19	6/10	9/9	3/13	3/5	5/5	-
Selenium	10/10	7/7	19/19	10/10	9/9	13/13	5/5	5/5	-
Thallium	10/10	7/7	17/19	10/10	8/9	12/13	5/5	5/5	-
Vanadium	10/10	7/7	19/19	10/10	9/9	13/13	5/5	5/5	-
Zinc	10/10	7/7	19/19	10/10	9/9	13/13	5/5	5/5	-

TABLE 64
ECOLOGICAL TARGET DECISION LEVEL EXCEEDENCE SUMMARY
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

SOIL	5-1	5-3	5-4	5-5	5-6	5-7	5-9	5-10	Add
Surface Soil									
Antimony	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Arsenic	3/5	1/5	1/6	0/3	2/4	0/3	0/2	-	-
Barium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Beryllium	0/5	0/5	0/6	0/3	0/4	0/3	0/2	-	-
Cadmium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Chromium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Cobalt	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Copper	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Lead	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Mercury	1/5	1/5	1/6	0/3	0/4	0/3	0/2	-	-
Nickel	5/5	4/5	6/6	3/3	3/4	3/3	2/2	-	-
Selenium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Thallium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Thallium	9/9	6/6	12/12	6/6	7/7	8/8	5/5	9/9	-
Vanadium	9/9	6/6	12/12	6/6	7/7	8/8	5/5	9/9	-
Zinc	9/9	6/6	12/12	6/6	7/7	8/8	5/5	9/9	-
Release Sampling									
Antimony	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Arsenic	5/5	1/5	1/6		2/4			-	-
Barium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Cadmium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Chromium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Cobalt	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Copper	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Lead	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Mercury	1/5	1/5	1/6					-	-
Nickel	5/5	5/5	6/6	3/3	3/4		2/2	-	-
Selenium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Thallium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Vanadium	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Zinc	5/5	5/5	6/6	3/3	4/4	3/3	2/2	-	-
Seep Soil									
Antimony	-	-	-	1/1	-	3/3	-	1/1	-
Arsenic	-	-	-		-	1/3	-	1/1	-
Barium	-	-	-	1/1	-	3/3	-	1/1	-
Beryllium	-	-	-		-	2/3	-		-
Cadmium	-	-	-	1/1	-	3/3	-	1/1	-
Chromium	-	-	-	1/1	-	3/3	-	1/1	-
Cobalt	-	-	-	1/1	-	3/3	-	1/1	-
Copper	-	-	-	1/1	-	3/3	-	1/1	-
Lead	-	-	-	1/1	-	3/3	-	1/1	-
Nickel	-	-	-	1/1	-	3/3	-	1/1	-
Selenium	-	-	-	1/1	-	3/3	-	1/1	-
Thallium	-	-	-	1/1	-	2/3	-	1/1	-
Vanadium	-	-	-	1/1	-	3/3	-	1/1	-
Zinc	-	-	-	1/1	-	3/3	-	1/1	-
Carbon Disulfide		-	-		-		-	1/2	-
Sediment									
Arsenic				2/2		1/4			
Chromium	2/3								
Cobalt	2/3								
Copper	2/3								
Lead	3/3	2/6	1/4	2/2		2/4	3/3	2/3	1/1
Nickel	1/3	1/6	4/4		2/2		2/3	1/3	1/1
Silver	1/3								
Zinc	3/3	1/6	2/4			3/4	3/3	3/3	1/1

TABLE 64
ECOLOGICAL TARGET DECISION LEVEL EXCEEDENCE SUMMARY
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

Surface Water									
	5-1	5-3	5-4	5-5	5-6	5-7	5-9	5-10	Add
Seeps									
Beryllium	-	-	-		-	3/3	-		-
Cobalt	-	-	-		-	3/3	-	1/1	-
Lead	-	-	-	1/1	-	1/3	-		-
Nickel	-	-	-		-	3/3	-		-
Selenium	-	-	-		-	2/3	-		-
Silver	-	-	-	1/1*	-	3/3*	-	1/1*	-
Zinc	-	-	-		-	3/3	-	1/1	-
Surface Water									
Barium				1/2				3/3	
Beryllium				2/2		4/4		2/3	
Cadmium								2/3	
Chromium				1/2				2/3	
Cobalt			1/5	2/2		4/4	1/3	2/3	
Copper				2/2				3/3	
Lead	3/3			2/2				3/3	
Nickel				2/2		1/3		1/3	
Selenium				1/2		2/4		2/3	
Silver	2/3	6/6*	5/5*	2/2*	2/2*	4/4*	3/3*	2/3	1/1*
Vanadium				2/2				2/3	
Zinc	1/3			2/2		4/4		2/3	

*Exceedence is the result of laboratory detection limit exceeding Target Decision Level.

TABLE 65
SOIL SCREENING LEVEL EXCEEDENCE SUMMARY
RCRA FACILITY INVESTIGATION
LAUFEN INTERNATIONAL
EAST SPARTA, OHIO

RELEASE SOIL								
	5-1	5-3	5-4	5-5	5-6	5-7	5-9	5-10
Subsurface Soil		0/6	0/12	0/6	0/7			0/9
Arsenic						3/8	1/5	
Chromium	1/9							
Nickel							1/5	

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APPENDIX A

INITIAL HYDROGEOLOGIC STUDY

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**INITIAL HYDROGEOLOGIC STUDY
RCRA FACILITY INVESTIGATION**



Prepared for:
**UNITED STATES CERAMIC TILE COMPANY
EAST SPARTA, OHIO**

CEC Project 060770.0002

November 2006

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Appendix B	Well Development Logs

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1.0 INTRODUCTION

This document comprises the written report with regard to the Initial Hydrogeologic Study (IHS) conducted in support of the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). The IHS was performed by Civil & Environmental Consultants, Inc. (CEC) on behalf of the United States Ceramic Tile Company (USCT).

The USCT Facility is located at 10233 Sandyville Road, S.E. in East Sparta, Pike Township, Stark County, Ohio (Figure 1). The USCT plant and associated property owned by USCT in East Sparta currently consists of approximately 733 acres. Most of the parcels are contiguous and are included as part of the RFI study area. As defined in the Work Plan, there are several Areas of Interest (AOIs) that are the focus of the RFI (see Figure 2). Most of the AOIs were excavated areas that were formerly mined for clay or shale that was historically used to manufacture tiles, but have been filled with mine spoil and reject tiles. No waste or off-spec materials are currently managed or disposed on or within the AOIs.



2.0 PURPOSE AND OBJECTIVES OF THE STUDY

Previous geologic and hydrogeologic studies conducted at the Facility indicated that two shallow water-bearing units may be present: 1) the uppermost water-bearing zone located within unconsolidated materials; and 2) water-bearing zone(s) located in the upper portions of the bedrock unit(s). The water-bearing unit in the unconsolidated materials was identified in monitoring wells installed in the vicinity of the closed hazardous waste landfill and former settling basin. No wells were completed in the unconsolidated materials located in the upland areas of the Facility. This information is contained in the Description of Current Conditions (DOCC) Report (CEC, 2004).

As part of the Phase I RFI Work Plan Approval with Conditions and/or Modifications by the U.S. EPA (April 2006), an Initial Hydrogeologic Study (IHS) was presented in Section 6.2 of the Field Sampling and Analysis Plan (FSAP). As described in the work plan, the purpose of the study was:

- to better define groundwater occurrence in unconsolidated materials at the AOIs;
- to evaluate the hydraulic relationship between the shallow groundwater and surface water where such groundwater and surface water occurs in these materials;
- to aid in the determination of monitoring well placement locations prior to mobilization for those efforts as part of Phase I of the RFI;
- to determine the absence or presence of seeps that may require investigation during Phase I of the RFI;
- to provide a preliminary indication of the probable direction of groundwater flow in the saturated unconsolidated materials; and
- to determine the elevations of the surface water bodies near the AOIs to evaluate the influence of surface water on the migration of contaminants from the AOIs

As described in the approved Work Plan, some of the AOIs were grouped together as "Study Areas" to evaluate the results on a more local level. These Study Areas are as follows.



- *Study Area 1: Consisting of AOI 5-4, AOI 5-9 and AOI 5-10*
- *Study Area 2: Consisting of AOI 5-7*
- *Study Area 3: Consisting of AOI 5-5 and AOI 5-6*
- *Study Area 4: Consisting of AOI 5-3*

Using this approach, the data obtained from the hydrologic and hydrogeologic field investigation conducted from each of the AOIs within the Study Areas was combined and evaluated on a more local level, if appropriate.



3.0 SUMMARY OF WORK PERFORMED

The field investigation for the IHS was conducted during the months of May through August 2006. The work tasks, procedures and methodologies used were, to the extent possible, conducted in accordance with the approved Phase I RFI Work Plan (June 2006). Deviations from the Work Plan were as follows:

- One additional boring (B-6) was installed inside the fill area of AOI 5-4 to attempt to intersect groundwater possibly flowing between the western and eastern pond.
- Boring B-2 was advanced approximately four feet into coal and sandstone bedrock to facilitate the installation of piezometer PZ-1.
- Potentiometric maps were not prepared for each of the individual Study Areas as proposed due to the lack of groundwater encountered in the Study Areas.

3.1 Soil Borings

The work performed involved drilling eleven borings (B-1 through B-11) into either the first water bearing zone or to the top of bedrock, whichever was encountered first. The locations of the borings are shown on Figure 3. Where groundwater was encountered, (B-2 and B-11) piezometers were installed, developed and surveyed to determine the groundwater flow conditions in the unconsolidated materials. The locations of the piezometers installed as part of the IHS are presented on Figure 3. Additional information collected from selected additional borings and temporary monitoring wells installed as part of the Phase I RFI have been included to aid in the description and understanding of the hydrogeologic setting of the USCT property.

The initial drilling effort for the USCT IHS commenced on May 15, 2006. Drilling services were provided by Frontz Drilling, Co., Wooster, Ohio under the direct supervision of CEC. Depending on site conditions, drilling was completed using both a truck-mounted drilling rig and/or an ATV rig. Soil borings associated with the IHS and the Phase I RFI subsurface investigation were advanced into and/or through the unconsolidated materials using 4.25-inch inner diameter (ID) hollow-stem augers. The



IHS borings were advanced until reaching either a water-bearing zone or bedrock, whichever occurred first. During drilling, soil samples were collected continuously using a 5- foot continuous sampler. A summary of the drilling program, by location, is provided in Table 1. Copies of the soil boring logs are included in Appendix A. The information provided on the boring logs includes sample color, composition, density/cohesiveness and any other notable features.

Specific details regarding the work performed at the individual Study Areas is presented below.

Study Area 1 (AOI 5-4, AOI 5-9 and AOI 5-10)

Four (4) soil borings (B-4 through B-7) were installed for the IHS in Study Area 1. Two (2) soil borings (B-4 and B-6) were advanced inside the limits of AOI 5-4 to the top of bedrock, encountered at 43 and 26 feet below ground surface (bgs), respectively. At these locations, the unconsolidated materials consisted of mine spoil material. The bedrock at B-4 was coal, and the bedrock at B-6 was sandstone. Soil boring B-5 was installed to the southeast of AOI 5-9. This boring was advanced through mine spoil to shale bedrock, which was encountered at approximately 17 feet bgs. Soil boring B-7 was installed to the southeast of the estimated limits of fill at AOI 5-10. Weathered sandstone bedrock was encountered in B-7 after drilling through approximately 4.5 feet of mine spoil. Groundwater was not encountered in the unconsolidated materials in any of these borings. Copies of the soil borings logs are contained in Appendix A.

Study Area 2 (AOI 5-7)

Three (3) soil borings (B-1 through B-3) were installed for the IHS in Study Area 2. Soil borings B-1, B-2 and B-3 were installed around the approximate fill area of AOI 5-7; all of which were advanced through mine spoil before encountering coal and/or sandstone bedrock. During drilling of B-1, located on the east side of AOI 5-7, coal bedrock was encountered at approximately 14.5 feet bgs. Groundwater was not encountered in the unconsolidated materials (mine spoil) at this location. At soil boring location B-2, located on the south side of AOI 5-7, sandstone and coal bedrock was encountered at approximately 16.5 feet bgs. Groundwater was encountered in the unconsolidated materials (mine spoil) at a depth of approximately 13.5 feet bgs. Soil boring B-3, located



on the north side of AOI 5-7, was advanced to a depth of approximately 9 feet bgs to the top of sandstone bedrock. Groundwater was not encountered in the unconsolidated materials (mine spoil) during drilling at B-3.

Study Area 3 (AOI 5-5 and AOI 5-6)

Two (2) soil borings (B-8 and B-9) were installed as part of the IHS in Study Area 3. Soil boring B-8 was installed on the east side of AOI 5-5. The unconsolidated materials consisted of mine spoil to a depth of approximately 14.5 feet bgs, where bedrock refusal was encountered. No groundwater was encountered during drilling at B-8. At AOI 5-6, one soil boring (B-9) was drilled on the east side of the estimated limits of fill. The subsurface materials identified during drilling included approximately 19 feet of mine spoil, at which depth bedrock was encountered. No groundwater was observed in the unconsolidated materials at soil boring location B-9.

Study Area 4 (AOI 5-3)

Two (2) borings (B-10 and B-11) were completed at AOI 5-3. At soil boring location B-10, the unconsolidated materials consisted of mine spoil to a depth of approximately 11 feet bgs, at which depth shale bedrock was encountered. No groundwater was encountered in the unconsolidated materials at B-10. Soil boring B-11 was advanced on the eastern side of AOI 5-3. During drilling, unconsolidated materials consisting of mine spoil were encountered to the total depth of the soil boring. Groundwater was encountered at a depth of approximately 26 feet bgs in a clayey sand layer.

3.2 Piezometer and Temporary Well Installation

Two piezometers, PZ-1 and PZ-2, were installed at soil boring locations B-2 and B-11, respectively). In addition, as part of the Phase I RFI field activities, temporary wells were installed at three locations (5-5-TEMP WELL, 5-7- TEMP WELL and 5-9 TEMP WELL) through the fill materials within the respective AOIs. The locations of the piezometers and temporary wells are shown on Figure 3.

The piezometers and temporary wells were installed using 2-inch ID, factory-machined 0.01-inch slotted polyvinyl chloride (PVC) screen and screw-type flush joint Schedule 40 PVC riser pipe. Ten (10) foot screen lengths were used in the construction of all



piezometers and temporary wells. The annular space around each screen was backfilled with a clean silica sand filter pack to minimize the passage of formation materials into the screen. The filter pack was installed to a depth of approximately two feet above the top of the screen. For the piezometers, a bentonite seal was placed from the top of the filter pack to near ground surface to provide hydraulic isolation of the screened interval. The bentonite was hydrated with water, in approximate two (2) foot lifts, to insure a good hydraulic seal of the water bearing zone of interest. The bentonite seal in the temporary wells was placed above the filter pack with an approximate thickness of two feet and hydrated with water. All of the construction materials were placed in the annular space by gravity feeding into the open borehole.

Once installation was complete, each of the installed piezometers and temporary wells were developed to improve the hydraulic communication between the sand pack and surrounding aquifer material, likewise, removing fines from sand pack. Development was initiated by surging with a new dedicated disposable bailer. A submersible pump was then used to purge the piezometers and temporary wells. To the extent possible, well development was performed until the temperature, pH and conductivity stabilized or until dry, whichever came first. Pumping rates, purge volumes, and water levels were also recorded during the development process. Development water was containerized in DOT approved 55-gallon drums and labeled accordingly. The pump was decontaminated between successive locations by pumping potable water through the pump intake and discharge lines.

Each piezometer and temporary well was surveyed to establish horizontal coordinates (northings and eastings). Measuring point elevations (top of PVC riser elevation relative to mean sea level) were surveyed to facilitate the calculation of water-level elevation data.

A summary of the piezometers and temporary well construction details and survey elevations are provided in Table 2. This table also includes data from TW-2 and TW-3, two permanent monitoring wells that were installed by Dames & Moore as part of the landfill groundwater assessment conducted in 1984. These wells are included as part of this IHS to provide supplemental groundwater data relative to groundwater in the



unconsolidated materials on the southeastern portion of the Facility. Well construction diagrams are included in Appendix A as part of the soil boring logs, and well development data sheets are included in Appendix B.

The piezometer installation program conducted during the IHS and Phase I RFI is summarized below.

Study Area 1 (AOI 5-4, AOI 5-9 and AOI 5-10)

A total of four (4) borings (B-4, B-5, B-6 and B-7) were advanced to bedrock in these areas. Groundwater was not encountered in the unconsolidated materials in any of these borings. As such, no piezometers were installed.

As part of the Phase I RFI, soil boring 5-9-SB-2, located in the east central portion of the AOI, was completed. During drilling, groundwater was encountered in the unconsolidated materials at a depth of approximately 14.5 feet bgs. The boring was advanced to a total depth of 16.5 feet bgs through mine spoil and tile fill materials, and temporary well 5-9-TEMP-WELL was installed.

Study Area 2 (AOI 5-7)

Three (3) borings (B-1, B-2 and B-3) were installed around the approximate fill area of AOI 5-7. Groundwater was encountered during drilling of B-2, located on the southwest side of AOI 5-7, at an approximate depth of 13.5 feet bgs. Sandstone and coal bedrock was encountered at a depth of approximately 16.5 feet bgs. Drilling continued into the bedrock to a depth of 20 feet bgs and a piezometer (PZ-1) was installed in this location. Groundwater was not encountered in any of the other borings, therefore no piezometers were installed.

As part of the Phase I RFI, soil boring 5-7-SB-3 was completed in the southern portion of the AOI 5-7. Groundwater was encountered in the unconsolidated materials at a depth of approximately 10 feet bgs. The boring was terminated in tile fill material at approximately 20 feet bgs. Temporary well 5-7-TEMP-WELL was installed at this location.



Study Area 3 (AOI 5-5 and AOI 5-6)

Two (2) borings (B-8 and B-9) were advanced to bedrock in this Study Area. Groundwater was not encountered; as such, no piezometers were installed in Study Area 3.

As part of the Phase I RFI, borehole 5-5-SB-2, located in the approximate center of the AOI, was advanced to twenty (20) feet bgs through mine spoil and tile fill materials. Groundwater was encountered at an approximate depth of 19.5 feet bgs. A temporary well (5-5-TEMP-WELL) was installed to a total depth of 20 feet bgs.

Study Area 4 (AOI 5-3)

Two (2) borings (B-10 and B-11) were installed at AOI 5-3. On the eastern side of AOI 5-3, B-11 was advanced to a depth of 35 feet bgs. Groundwater was encountered at an approximate depth of 26 feet bgs, and piezometer PZ-2 was installed in this borehole at a depth of 30 feet bgs. No groundwater was found during the drilling of B-10.

3.3 Seeps

The presence of several seeps was observed and verified as part of the IHS field investigation. The quantity of water flowing from the seeps varied from location to location, but all of the seeps appear to yield sufficient water to establish a surface water point source. The location of the seeps are shown on Figure 3 and are identified as 5-5 SEEP-1, 5-7 SEEP-1, 5-7 SEEP-2, and 5-10 SEEP-1.

Seeps generally occur where groundwater under hydraulic head daylights due to a combination of an underlying low permeability layer which limits downward flow of the groundwater, and overlying materials of a higher permeability that allows the groundwater to surface. This may occur at the Facility, for example, where groundwater percolates through and collects in the unconsolidated materials associated with the fill areas (higher permeability) that overlie lower permeability shale or clay. This appears to be the case at AOI 5-7, where the two seeps appear to be emanating from the base of the fill pile, and also may be reflective of conditions at the other seep locations.



3.4 Staff Gauge Installation

Six (6) staff gauges (STG-1 through STG-6) were installed in various surface water bodies on USCT property as shown on Figure 3 to aid in the development of a preliminary understanding of the flow regime(s) and the determination of flow conditions and surface water/groundwater interaction. The staff gauges were used to measure water elevations in the surface water bodies to allow comparison with shallow groundwater elevations obtained from the piezometers and/or temporary monitoring wells. Each staff gauge consists of two, 3.30-foot long, porcelain-enameled, U.S. Geological Survey (USGS) style C staff gauge sections attached to an 8-foot fiberglass post with stainless steel screws.

The staff gauges were installed in accordance with the following procedure.

1. An area near the bank of each water body was selected based on the following criteria:
 - a. safe accessibility by personnel wearing hip-waders;
 - b. apparent continuous inundation; and,
 - c. visibility of the staff gauge position from the bank of the water body.
2. The post was positioned such that elevation readings could be observed from the bank of the water body.
3. The post was driven at least two feet below the sediment surface using a 25-pound post driver placed over the top of the post.
4. The bottom of the first gauge section (ranging from 0.00 feet at the bottom of the section to 3.30 feet at the top of the section) was placed on the surface of the sediment and attached to the post with stainless steel screws.
5. The bottom of the second gauge section (ranging from 3.31 feet at the bottom of the section to 6.60 feet at the top of the section) was positioned adjacent to the top of the first gauge section and attached to the post with stainless steel screws.



The location of the staff gauges is summarized below:

- STG-1: Located in the large surface water body (Pond A) on the west side of AOI 5-4. Water level measurements can be obtained from the northern bank of Pond A.
- STG-2: Located in the surface water body (Pond B) southwest of AOI 5-4 and northwest of AOI 5-9. Water level measurements can be obtained from the northern bank of Pond B.
- STG-3: Located in the surface water body (Pond C) southwest of AOI 5-9. Water level measurements can be obtained from the western bank of Pond C.
- STG-4: Located in the surface water body (Pond D) on the east side of AOI 5-4. Water level measurements can be obtained from the western bank of Pond D.
- STG-5: Located in the surface water body (Pond E) on the west side of AOI 5-6. Water level measurements can be obtained from the eastern bank of Pond E.
- STG-6: Located in the large surface water body (Pond F) on the south side of AOI 5-3. Water level measurements can be obtained from the northern bank of Pond F.

After installation was complete, each staff gauge was surveyed to establish horizontal coordinates (northings and eastings), and elevation relative to mean sea level (msl).

3.5 Groundwater and Surface Water Elevation Measurements

Groundwater level and surface water level measurements were collected on two occasions, separated by about 30 days (July 10 and August 9, 2006). At each of the newly installed piezometers (PZ-1 and PZ-2) and temporary wells (5-5-TEMP WELL, 5-7-TEMP WELL and 5-9 TEMP WELL), the depth to water was measured from a survey mark on the top of PVC casing. In addition, water-level measurements were collected from existing monitoring wells TW-2 and TW-3. An electronic water level indicator was used for the depth to water measurements with each measurement recorded to the nearest one-hundredth (0.01) foot. The depth to water measurement was then subtracted from the elevation of the reference point to calculate the groundwater elevation.



Concurrent with the groundwater level measurements, the surface water elevation at each of the six newly installed staff gauges (SG-1 through SG-6) were measured. The staff gauge measurements were obtained by direct measurement of the water level on the calibrated staff gauge and recorded to the nearest one-hundredth (0.01) foot. The water-level measurement was then added to the elevation of the zero (0) mark to calculate the surface water elevation.



4.0 FINDINGS

4.1 Geologic Setting

The following section presents a description of the regional geology of the unconsolidated materials in the vicinity of the USCT facility. The information is based on published literature, publicly available well records, and reports of previous investigations for the USCT property. This is followed by a description of the site-specific geologic setting, based on information gathered from previous reports and the results of the IHS and Phase I RFI work tasks.

4.1.1 Regional Geology

Stark County lies within two subdivisions of the Appalachian Plateau Physiographic Province. The northern two-thirds of the county lie in the glaciated section of the Appalachian Plateau, while the rest of the county (and the USCT Facility) is within the unglaciated section. The county has undergone glaciation twice, during the Illinoian and Wisconsinan glacial advances.

Stark County has more diverse glacial deposits than any other county in Ohio, and is where two glacial lobes (Grand River Lobe and Killbuck Lobe) converged. The glacial deposits within the county vary from kame, kame terraces, outwash deposits, glacial end, hummocky and ground moraine deposits comprised of Kent Till, Titusville Till, Navarre Till, Astabula Till and Lavery Till laid down during the Wisconsinan glacial stage, and Mapledale Till laid down during the Illinoian glacial stage. The glacial deposits can be as thick as 200 feet in buried bedrock valleys and can be as thin as five feet thick in the uplands (White, 1982).

4.1.2 Site-Specific Geology

The identification of the unconsolidated units at the USCT property are based on the results of the soil borings drilled around the property area during previous investigations, the IHS, and the Phase I RFI subsurface investigation. Appendix A contains drilling logs for all soil borings associated with the IHS.



Previous studies (Dames & Moore, 1988) identified three major types of unconsolidated materials that overlie bedrock on USCT property:

- Mine spoil: These materials consisted of brown or gray silty clay with some sand and gravel, and fragments of rock (coal, shale, and sandstone). Because the material is re-worked, it was heterogeneous and varied in thickness. The mine spoil was observed by Dames & Moore in soil samples collected during the drilling performed adjacent to the former settling basin and existing landfill.
- Alluvial (floodplain) sediments: These materials consisted of brown silty clay and sandy clay with some pebbles. Unlike the mine spoil, these sediments were stratified and did not appear to be disturbed. These soils were found near the surface at soil borings drilled under the supervision of Dames & Moore at locations adjacent to, or within, the former settling basin.
- Residual soils: These sediments consisted of olive brown silty clay and clayey silt with pieces of shale when overlying shale bedrock and tan silts with some sand when overlying sandstone bedrock. These soils were observed by Dames & Moore close to the transition between the unconsolidated deposits and bedrock surface.

Of the three types of unconsolidated materials identified above by Dames & Moore, mine spoil was the predominant material encountered during the implementation of the IHS. Consistent with the type of materials identified during previous studies, the mine spoil materials encountered during the IHS and Phase I RFI were comprised of brown or gray intermixed silt and clay with fragments of rock (coal, shale, and sandstone) and occasional fragments of tile. The thickness of the mine spoil encountered in the soil borings completed during the IHS varied from 4.5 feet in B-7 to 43 feet in B-4.

Two generalized geologic cross-sections (Figures 4 and 5) were prepared to illustrate the relative nature and depth of the subsurface materials encountered at the Facility, and to show the relationship of the unconsolidated materials encountered to the underlying bedrock and other features on the Facility property.



4.2 Hydrogeologic Setting

The following section presents a description of the regional hydrogeology in the vicinity of the USCT facility. The information is based on published literature, publicly available well records, and reports of previous investigations for the USCT property. This is followed by a description of the site-specific hydrogeologic setting, based on information gathered from previous reports and the results of the IHS and Phase I RFI work tasks.

4.2.1 Regional Hydrogeology

Several principal water-bearing formations are utilized in Stark County for municipal, industrial, and private water supplies. These water-bearing units include deep glacial buried river valleys; inter-bedded and inter-lensing sand, gravel, silt and clay in glacial moraine deposits; valley fill containing sand and gravel deposits of limited thickness and extent; discontinuous bodies of sand and gravel in thick glacial till drift; and, alternating layers of sandstones and sandy shales of the Pottsville and Allegheny Groups of the Pennsylvanian System. County-wide water well yields range from 3 gallons per minute (gpm) from sandstone/shale units to over 2,000 gpm from buried river valley sand and gravel deposits.

In Pike Township groundwater is drawn from two principal water-bearing geologic formations; bedrock formations, and valley fill deposits associated with erosion along existing surface water bodies. The bedrock water-bearing units consist of the alternating layers of sandstone and shale of the Allegheny and Pottsville groups. A maximum reliable yield for these units is about 25 gpm. Valley fill containing sand and gravel deposits are present along the present-day drainage of Nimishillen Creek, Limestone Creek, and Bear Run. These unconsolidated deposits range from 10 to 160 feet in thickness and can produce sustainable yields ranging from approximately 10 to 30 gpm.

4.2.2 Site-Specific Hydrogeology

The initial determination of the site-specific hydrogeologic setting related to the AOIs being investigated as part of the RFI, pertains to the unconsolidated materials that underlie USCT property, and has been interpreted from the results of the IHS conducted



during May through August of 2006, and from information related to previous investigations conducted at the Facility.

The results of previous studies conducted at the Facility included drilling soil borings completed in the unconsolidated materials around the perimeter of the hazardous waste landfill and around or within the former settling basin. In these borings, shallow groundwater was identified in the unconsolidated materials that consist of both alluvial sediments and mine spoil materials. The location and occurrence of groundwater in this portion of the Facility indicates that a laterally continuous groundwater-bearing zone is present. Groundwater monitoring wells were installed at various locations as part of landfill closure and monitoring activities. These wells continue to be monitored as part of the Interim Measures – Area-Specific Risk Assessment.

No previous evaluation of the groundwater occurrence and/or movement in the unconsolidated materials was conducted for the portions of the Facility located west of Sandyville Road, which constitute the majority of the USCT property. The unconsolidated materials in this portion of the Facility are at a significantly higher elevation than those in the area of the hazardous waste landfill and former settling basin. During the IHS, soil borings were drilled into and through the unconsolidated materials at the four study areas, as described in Section 3.1 of this document. As described in Section 4.1, the unconsolidated materials observed during the drilling program consisted primarily of re-worked mine spoil materials. The results of the drilling program indicated that there was no continuous water-bearing zone in the unconsolidated materials in this portion of the Facility. Shallow groundwater was identified at selected locations, including AOI 5-3, AOI 5-5, AOI 5-7 and AOI 5-9. However, even within these units, the occurrence of groundwater in the unconsolidated materials was not laterally continuous. A total of two piezometers (PZ-1 and PZ-2) and three temporary wells (5-5 TEMP WELL, 5-7-TEMP WELL and 5-9 TEMP WELL) were installed as part of the IHS and Phase I RFI activities.

Measurements of groundwater levels in the piezometers and temporary wells were collected in July and August 2006. All of the measurements were referenced to the top of inner PVC well casing, for which survey elevations had been established in feet above



msl. Table 3 summarizes the groundwater level measurements and calculated groundwater elevations for the piezometers, temporary wells and monitoring wells TW-2 and TW-3. The locations of the monitoring points and groundwater elevations, and their relationship to the general site topography are shown on Figure 6. In general, the groundwater elevations mimic the topographic expressions, with the highest groundwater elevation occurring on the western portion of the study area (AOI 5-7) and the lowest groundwater elevations occurring on the southeastern portion of the property near AOI 5-3 (TW-2 and TW-3). Because the occurrence of groundwater in the unconsolidated materials is not laterally continuous across the Facility, no discernible pattern of groundwater flow can be concluded that would indicate hydraulic connectivity between these areas.

4.3 Hydrology

4.3.1 Regional Hydrology

Three major watersheds lie within Stark County: the Tuscarawas River, the Mahoning River and the Cuyahoga River. The Tuscarawas River system drains most of Stark County. The Tuscarawas River, originating in southern Summit County, flows generally southward through Stark and Tuscarawas Counties before turning to the west and joining the Walhonding River in Coshocton County forming the confluence of the Muskingum River. Portions of the Mahoning Rivers headwaters originate in northeastern Stark County. These waters flow northeast through southeastern Portage County, northwestern Mahoning County before turning to the southeast in Trumbull County. The Mahoning River then joins the Shenango River forming the confluence of Beaver River in western Pennsylvania which in turn discharges to the Ohio River. The northern portion of Stark County lies within the Cuyahoga River watershed. The Cuyahoga River flows generally northward through Summit and Cuyahoga Counties where it ultimately discharges to Lake Erie.

The USCT Facility lies within the Nimishillen Creek watershed system which is a tributary of Sandy Creek, which in turn drains to the Tuscarawas River. Nimishillen Creek drains the central portion of the county, and Sandy Creek drains southeastern Stark



County. Southwestern Stark County is drained by Sugar Creek, another tributary of the Tuscarawas River.

According to the USGS Water Resources Division website (<http://waterdata.usgs.gov>), the average stream flow recorded in 2005 at the Tuscarawas River gauging station at Massillon, Ohio, approximately 12 miles northwest of the USCT Facility (upstream), is 721.2 cubic feet per second (cfs). The Middle Branch of Nimishillen Creek gauging station in Canton, approximately 11 miles north of the USCT Facility (upstream) recorded an average stream flow for 2005 of 68.6 cfs. The average stream flow recorded in 2005 at the Sandy Creek gauging station at Waynesburg, Ohio, approximately 6 miles east/northeast of the USCT Facility, is 407.0 cfs. The 2005 average stream flow at the Nimishillen Creek gauging station in North Industry, located approximately 5 miles north of the USCT Facility (upstream), is 332.7 cfs.

4.3.2 Site-Specific Hydrology

The Facility is located to the west of Nimishillen Creek which discharges into Sandy Creek just south of Sandyville, Ohio. Sandy Creek discharges into the Tuscarawas River approximately four miles to the west of the USCT Facility near Bolivar, Ohio.

There is a topographic and hydraulic divide running north and south generally following Ridge Avenue through the central portion of the entire USCT Facility property (see Figure 1). Surficial topography generally slopes, and surface water drains, to the east or west along this divide. The RFI, and as a result, the IHS study, focus entirely on the areas located to the east of Ridge Avenue, and does not include the areas located to the west of Ridge Avenue.

Previous studies indicated that the natural hydrologic setting on the Facility site has been modified significantly by railroad and highway construction, strip mining activities, and stream channelization. These activities have altered the original infiltration and surface runoff patterns in the vicinity of the Facility. In the absence of local man-made influences (i.e., storm water sewers, ditches, mine pits), the majority of the surface water



runoff in the IHS study area flows eastward toward the tributaries or the main body of Nimishillen Creek.

There are several unnamed tributary streams that originate within the Facility. In general, these unnamed tributaries flow from the northwest to the southeast and discharge into on-site wetlands, ponds, or other unnamed tributaries. The majority of these headwater streams feature high gradient channels located in forested areas. The ephemeral and intermittent sections of stream typically have very small upstream drainage areas. The stream banks along the unnamed tributaries are moderately incised, well vegetated and, for the most part, stable. The substrate within the unnamed tributaries mainly consists of cobble, gravel, sand, silt and fine sediment.

There are numerous surface water bodies located throughout the property, the majority of which have been created as a result of historic mining operations and/or fill placement in the downstream sections of the low-lying areas and/or streams. The downstream embankments were constructed from mine spoil, overburden, and/or reject tile. Unreclaimed highwalls or mine spoil piles were observed near several of these open water areas.

Surface water level measurements were collected from the staff gauges installed in the surface water bodies, as described in Section 3.3, during July and August of 2006, approximately 30 days apart. The surface water measurements and calculated water-level elevations are summarized in Table 4. The locations of the monitoring points and surface water elevations, and their relationship to the general site topography are shown on Figure 7. The collected measurement information indicates that the elevations of the surface water bodies demonstrated some variability between the two monitoring events, and that in general, the surface water is at higher elevations on the western side of the study area than those on the eastern side indicating that the overall surface water drainage follows the topographic expression from northwest to southeast.



5.0 CONCLUSIONS

The IHS included the installation of eleven (11) soil borings into the unconsolidated materials within the study area, resulting in the installation of two (2) piezometers. Staff gauges were installed in six (6) of the surface water ponds and water levels in the ponds and wells were measured on two (2) occasions and converted to water elevations to evaluate the relative differences of these levels across the site. Based on the results of the IHS, the following conclusions can be drawn

5.1 Shallow Groundwater Occurrence and Movement in Unconsolidated Materials

The results of the IHS and Phase I RFI work tasks indicate that there is not a laterally continuous or hydraulically connected water-bearing zone within the unconsolidated materials located within the IHS areas. Rather, shallow groundwater was found to occur in isolated areas within the unconsolidated materials. In addition, it is concluded that where shallow groundwater occurs, it was usually found within areas consisting of non-native fill materials comprised mainly of mine spoil.

Groundwater elevations and assumed flow direction(s) indicate that land surface elevations and topography are the primary factors that would influence groundwater movement. In the northern and western portions of the study area, groundwater (where encountered) is found at higher elevations than groundwater on the south and eastern side of the study area.

5.2 Surface Water Elevations and Hydraulic Relationship with Shallow Groundwater

Surface water within the study area is manifested in small ponds, drainage channels/ditches and seeps. Surface water elevations generally mimic the topographic relief, with elevations being highest to the west and lowest to the east. The surface water features are partially or wholly recharged by runoff and overland flow in response to precipitation events. At most of the surface water bodies, no confirming observable evidence of discharge points was identified.



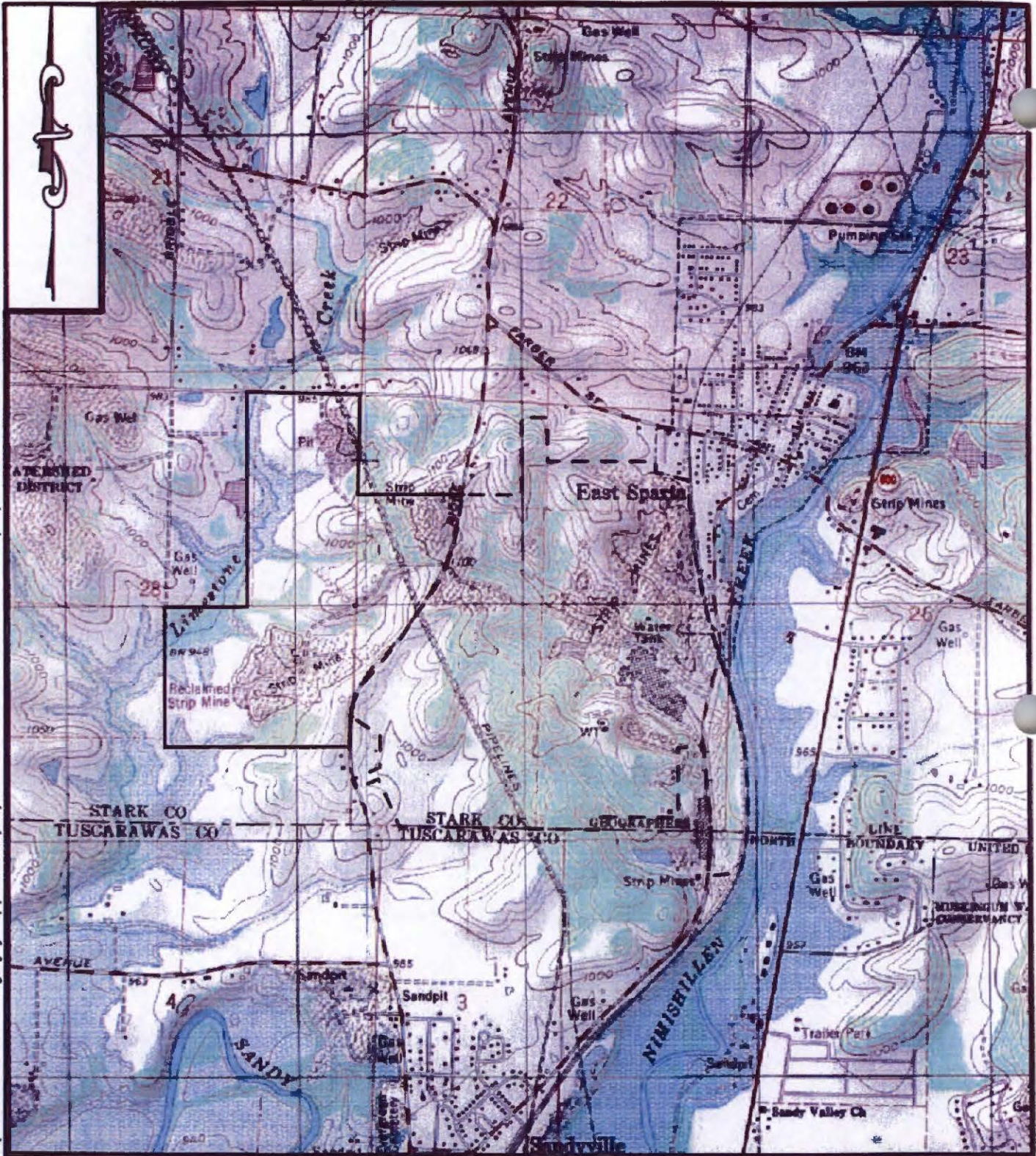
No clear lines of evidence were identified that indicate a strong hydraulic relationship between the occurrence and movement of shallow groundwater within the unconsolidated materials and surface water. In addition, no clear evidence of hydraulic connectivity between individual surface water bodies was identified. One area that supports this conclusion is AOI 5-4, which is bounded to the west and east by surface water. Two soil borings were advanced within AOI 5-4 to the approximate surface water elevations in the ponds adjacent to either side of this AOI. If there was a hydraulic relationship and connectivity with shallow groundwater occurrence and/or neighboring surface water bodies, it would be expected that groundwater would have been encountered. However, no groundwater was found in either of these borings before bedrock was encountered.

As such, the current monitoring well network installed during Phase I of the RFI is adequate and appropriate for the purposes of determining the absence or presence of a release to the shallow groundwater in the unconsolidated materials. The groundwater quality results for samples collected from the installed wells will be utilized to determine the absence or presence of a release at concentrations above the screening levels, and to determine the need for additional investigation.

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FIGURES

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——— US CERAMIC TILE PROPERTY BOUNDARY
- - - - - US CERAMIC TILE FACILITY BOUNDARY

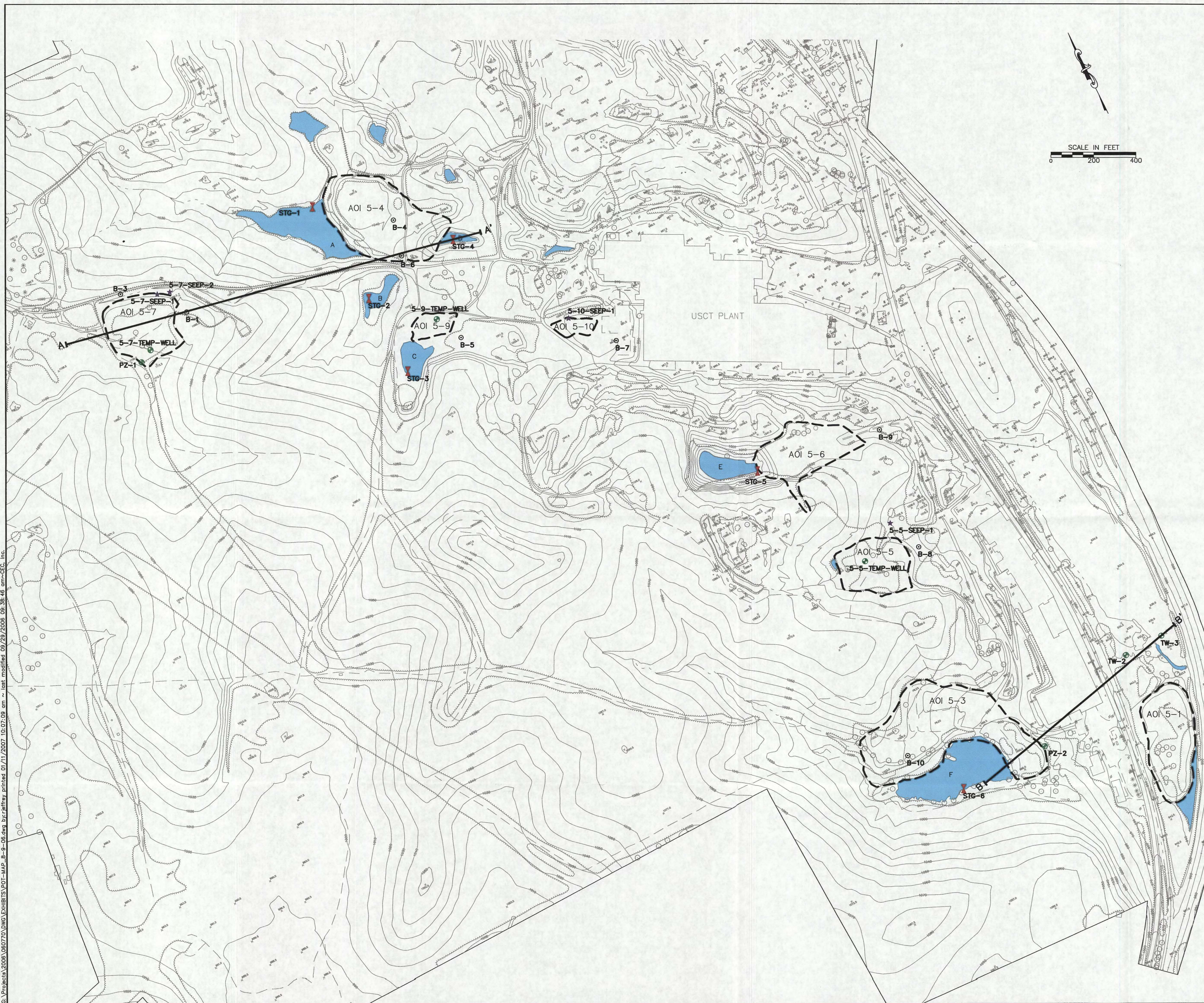


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SITE LOCATION MAP
INITIAL HYDROGEOLOGIC STUDY
US CERAMIC TILE COMPANY
EAST SPARTA, OHIO

DWN. BY: IJ	SCALE: 1"=2000'	DATE: OCT. 2006	PROJECT NO: 060-770	FIGURE NO: 1
CHKD. BY: RJW				

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REVISION RECORD	
DATE	DESCRIPTION

- APPROXIMATE FILL LIMITS
- ⏏ STAFF GAUGE
- ⊕ MONITORING WELL, PIEZOMETER OR TEMPORARY WELL
- ⊙ BORING
- ★ SEEP
- A POND IDENTIFICATION
- AOI 5-5 AREA OF INTEREST
- A—A' CROSS SECTION LINE



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**RCRA FACILITY INVESTIGATION
INITIAL HYDROGEOLOGIC STUDY
US CERAMIC TILE COMPANY
EAST SPARTA, OHIO**

DATE: OCT 2006

APPROVED BY:

DWN BY: ILJ

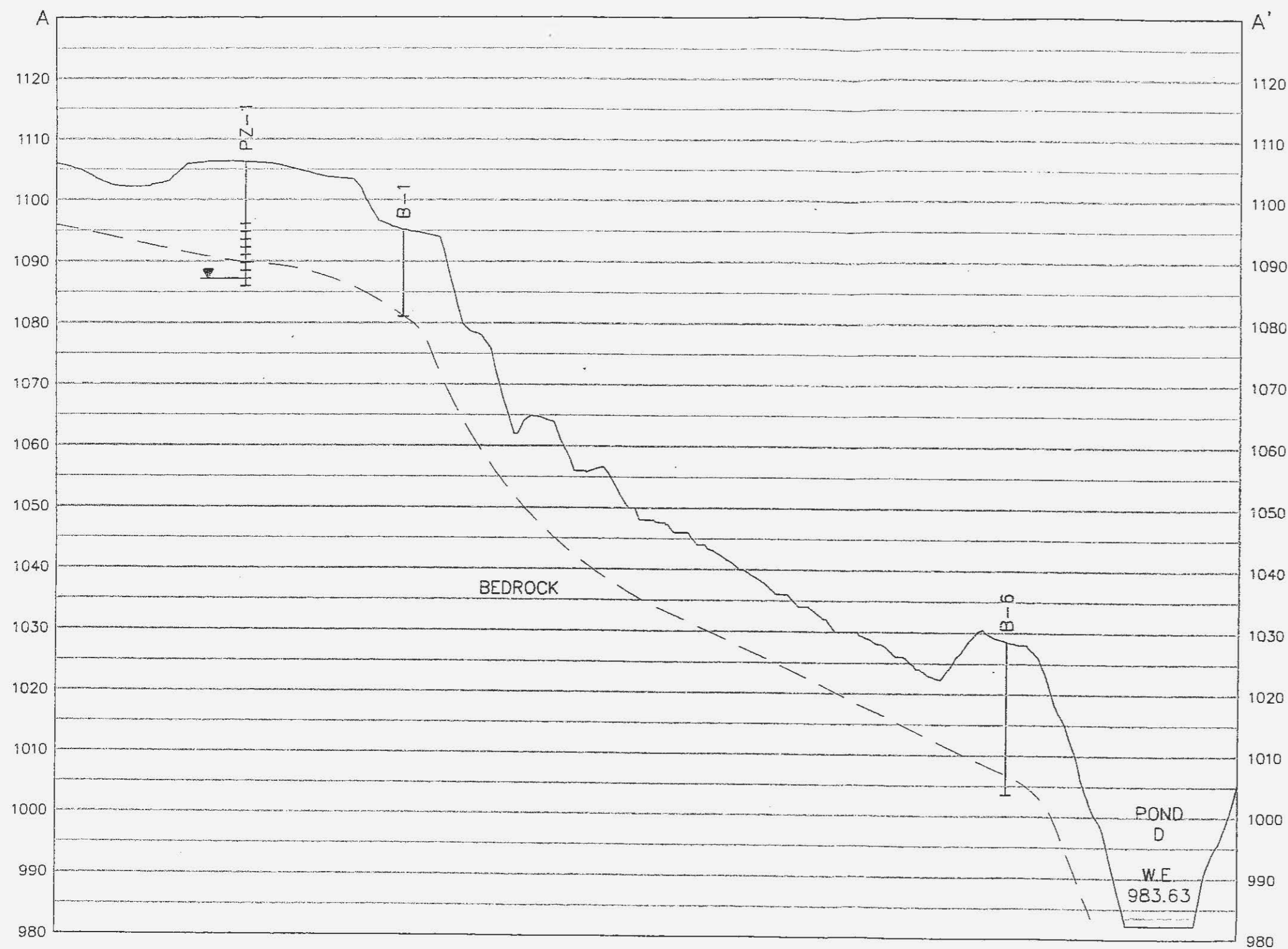
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RJW









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**BORING, PIEZOMETER, &
STAFF GAUGE LOCATIONS**


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3**

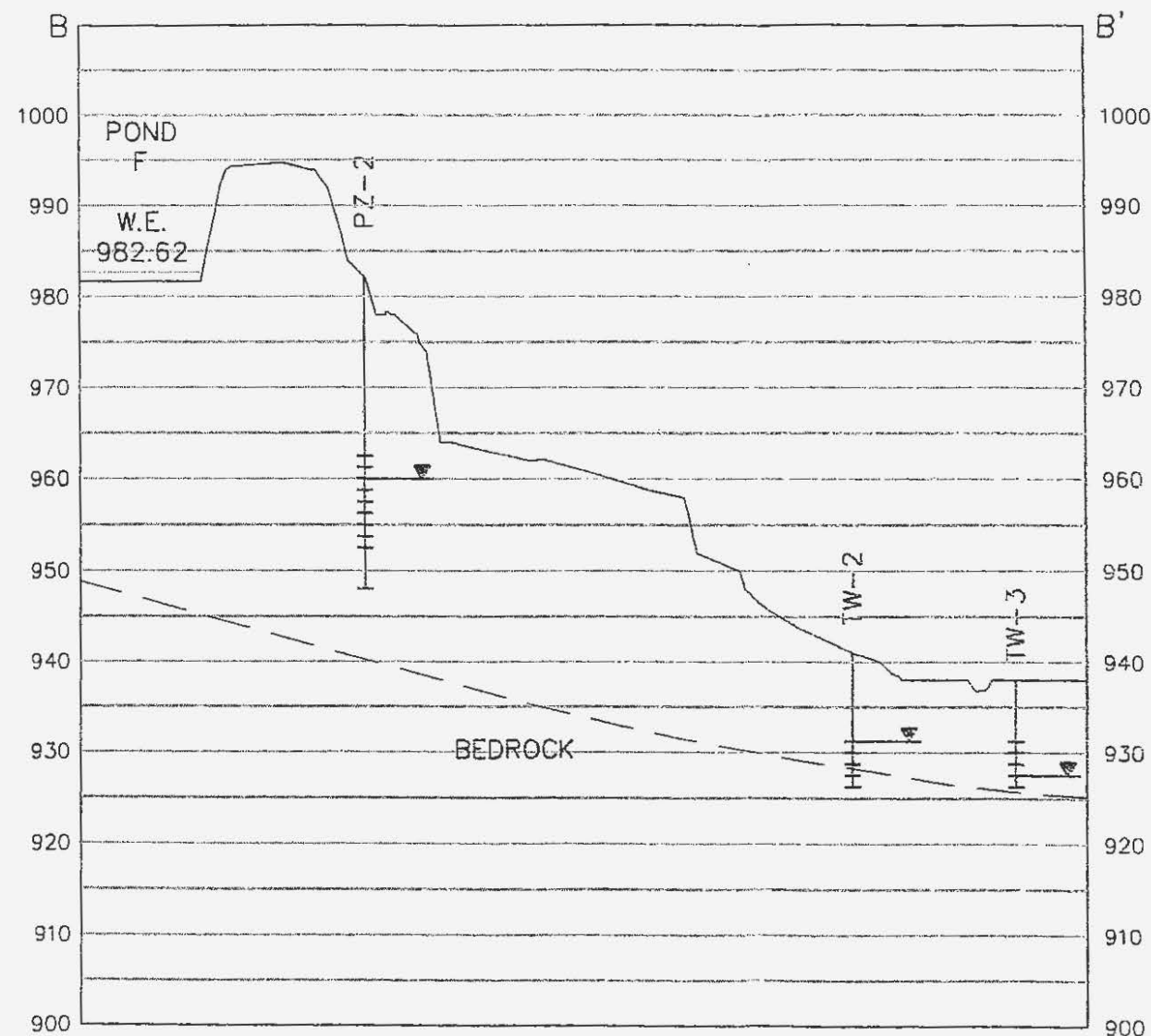


LEGEND

-  WATER LEVEL ELEVATION
AUGUST 9, 2006
-  B-1
SOIL BORING
-  PZ-1
PIEZOMETER
-  SCREENED
INTERVAL
-  APPROXIMATE BEDROCK
-  TOPOGRAPHIC SURFACE
-  W.E. 983.63 SURFACE WATER ELEVATION
AUGUST 9, 2006
-  POND D
SURFACE WATER BODY

SCALE: HORIZ. 1"=200'
VERT. 1"=20'


 Civil & Environmental Consultants, Inc. COLUMBUS, OHIO (614) 540 6633 • (888) 598-6808 Cincinnati, OH • Pittsburgh, PA • Indianapolis, IN • Nashville, TN		CROSS SECTION A-A' RCRA FACILITY INVESTIGATION INITIAL HYDROGEOLOGIC STUDY US CERAMIC TILE COMPANY	
DWN. BY: JRS	SCALE: AS SHOWN	DATE: OCT. 2006	PROJECT NO.: 060-770
CHKD. BY: RJW			FIGURE: 4



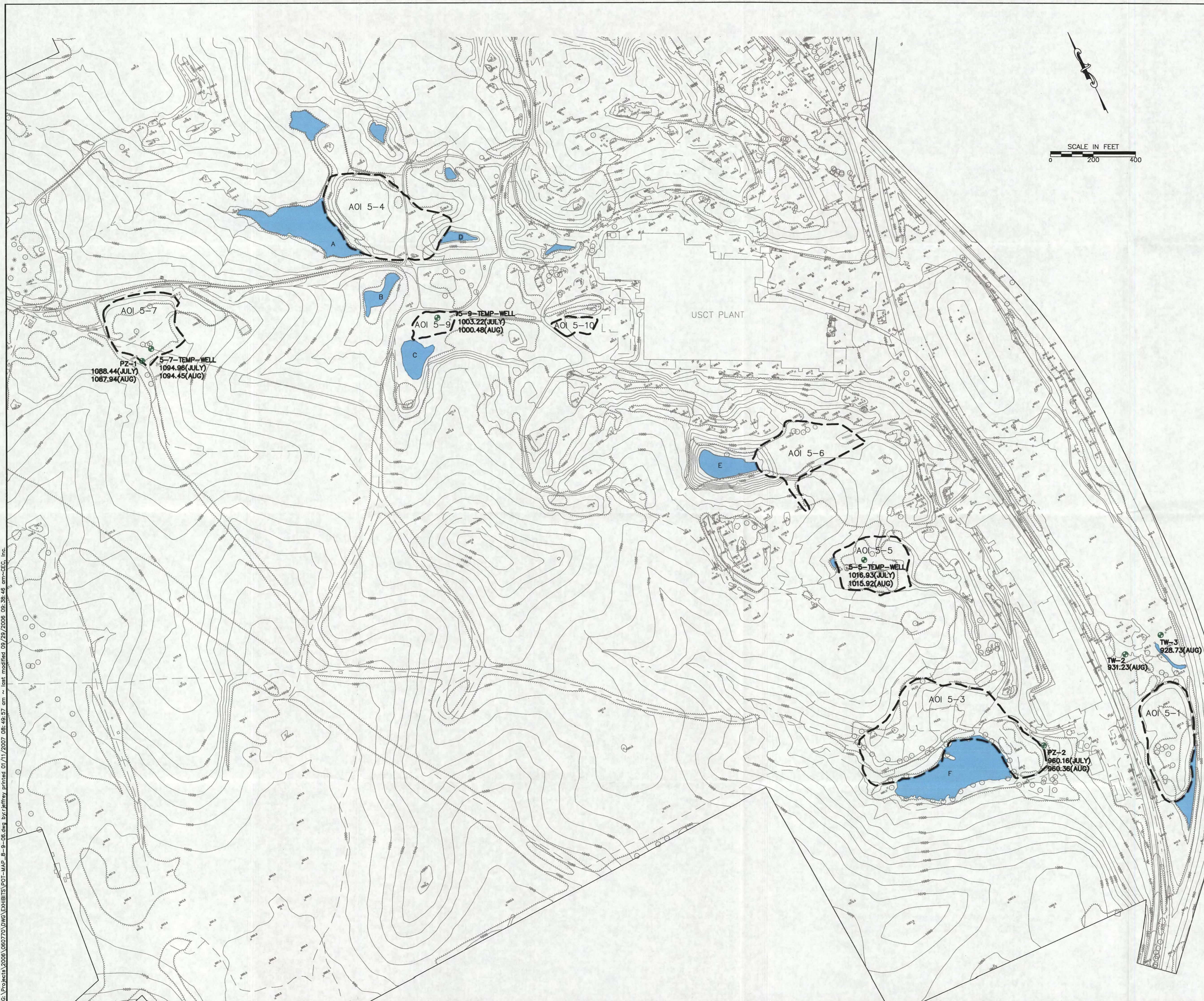
LEGEND

- WATER LEVEL ELEVATION
AUGUST 9, 2006
- PZ-2/TW-2
PIEZOMETER/MONITORING WELL
- SCREENED
INTERVAL
- APPROXIMATE BEDROCK
- TOPOGRAPHIC SURFACE
- W.E. 982.62
SURFACE WATER ELEVATION
AUGUST 9, 2006
- POND F
SURFACE WATER BODY

SCALE: HORIZ. 1"=200'
VERT. 1"=20'

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DWN. BY: JRS CHKD. BY: RJW	SCALE: AS SHOWN	DATE: OCT. 2006	PROJECT NO.: 060-770	FIGURE: 5

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REVISION RECORD	
DATE	DESCRIPTION

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- APPROXIMATE FILL LIMITS
- MONITORING WELL, PIEZOMETER OR TEMPORARY WELL
- A POND IDENTIFICATION
- PZ-1 ID
- 1016.93 GROUNDWATER ELEVATION (JULY)
- 1015.92 GROUNDWATER ELEVATION (AUG)
- AOI 5-5 AREA OF INTEREST



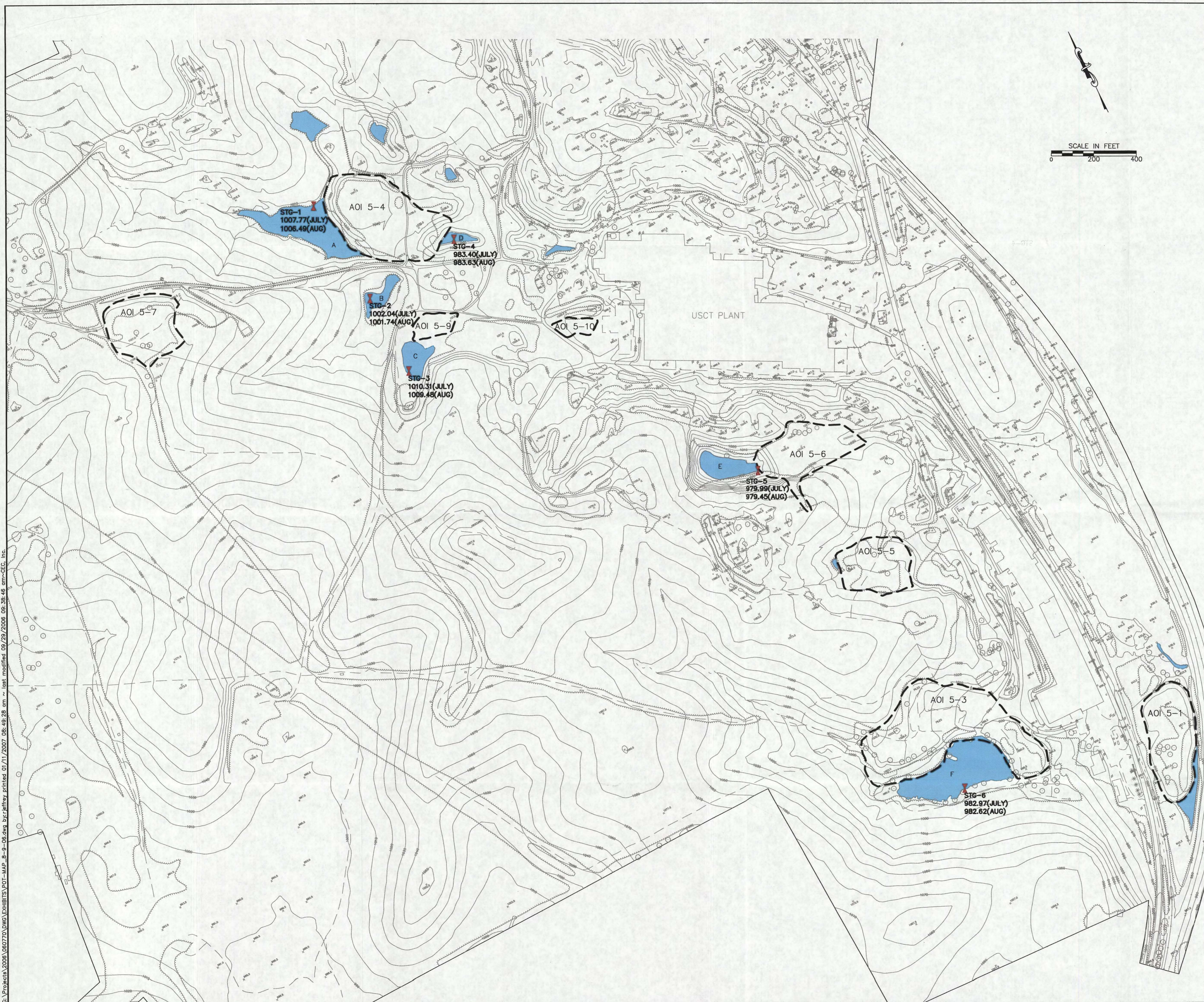
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RCRA FACILITY INVESTIGATION
INITIAL HYDROGEOLOGIC STUDY
US CERAMIC TILE COMPANY
EAST SPARTA, OHIO


DATE: OCT 2006	APPROVED BY: RJW	DWN BY: IJJ
SCALE: 1"=200'		CHKD. BY: COF
GROUNDWATER ELEVATIONS		SHEET OF DRAWING NUMBER 6

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REVISION RECORD	
DATE	DESCRIPTION

- APPROXIMATE FILL LIMITS
- STAFF GAUGE
- A POND IDENTIFICATION
- STG-1 ID
- 1016.93 SURFACEWATER ELEVATION (JULY)
- 1015.92 SURFACEWATER ELEVATION (AUG)
- AOI 5-5 AREA OF INTEREST

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RCRA FACILITY INVESTIGATION
INITIAL HYDROGEOLOGIC STUDY
US CERAMIC TILE COMPANY
EAST SPARTA, OHIO

DATE: OCT 2006	APPROVED BY: RJW	DWN BY: IJJ
SCALE: 1"=200'		CHKD. BY: COF
SURFACE WATER ELEVATIONS		SHEET OF DRAWING NUMBER 7

TABLES

TABLES

TABLE 1
SUMMARY OF BORING PROGRAM
 Initial Hydrogeologic Study
 Phase I RCRA Facility Investigation
 U.S. Ceramic Tile Company
 East Sparta, Ohio

Study Area	AOI	Boring ID	Total Depth (bgs)	Presence of Groundwater	Piezometer Installed?	Piezometer ID
1	5-4	B-4	43	No	No	NA
1	5-4	B-6	25	No	No	NA
1	5-9	B-5	17	No	No	NA
1	5-10	B-7	5	No	No	NA
2	5-7	B-1	14.5	No	No	NA
2	5-7	B-2	20	Yes	Yes	PZ-1
2	5-7	B-3	9	No	No	NA
3	5-5	B-8	14.5	No	No	NA
3	5-6	B-9	19	No	No	NA
4	5-3	B-10	11	No	No	NA
4	5-3	B-11	35	Yes	Yes	PZ-2

TABLE 2
SUMMARY OF PIEZOMETER AND WELL CONSTRUCTION DETAILS
Initial Hydrogeologic Study
Phase I RCRA Facility Investigation
U.S. Ceramic Tile Company
East Sparta, Ohio

Monitoring Well ID	Top of Casing Elevation (ft msl)	Screened Interval (ft bgs)	Total Depth of Well (ft bTOC)	Screened Material
PZ-1	1109.62	10-20	22.52	Mine spoil and sandstone/coal bedrock
PZ-2	984.63	20-30	30.29	Mine spoil
5-5 Temp-Well	1028.03	10-20	20.28	Mine spoil with tile fragments
5-7 Temp-Well	1106.00	10-20	19.32	Mine spoil with tile fragments
5-9 Temp-Well	1016.07	6.5-16.5	20.11	Mine spoil with tile fragments
TW-2	940.50	10-15	15.00	Mine spoil and shale bedrock
TW-3	936.50	7-12	12.00	Mine spoil and shale bedrock

TABLE 3
GROUNDWATER ELEVATION DATA
 Initial Hydrogeologic Study
 Phase I RCRA Facility Investigation
 U.S. Ceramic Tile Company
 East Sparta, Ohio

Well Designation	Measuring Point Elevation (ft msl)	Measured Groundwater Level (ft)	Groundwater Elevation (ft msl)
PZ-1			
10-Jul-06	1109.62	21.18	1088.44
9-Aug-06	1109.62	21.68	1087.94
PZ-2			
10-Jul-06	984.63	24.47	960.16
9-Aug-06	984.63	24.27	960.36
5-5-Temp-Well			
10-Jul-06	1028.03	11.10	1016.93
9-Aug-06	1028.03	12.11	1015.92
5-7-Temp-Well			
10-Jul-06	1106.00	11.04	1094.96
9-Aug-06	1106.00	11.55	1094.45
5-9-Temp-Well			
10-Jul-06	1016.07	12.85	1003.22
9-Aug-06	1016.07	15.59	1000.48
TW-2			
9-Aug-06	940.50	9.27	931.23
TW-3			
9-Aug-06	936.50	7.77	928.73

NOTES:

PZ = Piezometer
 TW = Test Well
 ft = Feet
 ft msl = Feet above mean sea level

TABLE 4
SURFACE WATER ELEVATION DATA
Initial Hydrogeologic Study
Phase I RCRA Facility Investigation
U.S. Ceramic Tile Company
East Sparta, Ohio

Staff Gauge Location	Measuring Point Elevation (ft msl)	Measured Surface Water Level (ft)	Surface Water Elevation (ft msl)
	0.00 Mark	Above 0.00 Mark	
STG-1			
10-Jul-06	1005.29	2.48	1007.77
9-Aug-06	1005.29	1.20	1006.49
STG-2			
10-Jul-06	1000.54	1.50	1002.04
9-Aug-06	1000.54	1.20	1001.74
STG-3			
10-Jul-06	1008.36	1.95	1010.31
9-Aug-06	1008.36	1.12	1009.48
STG-4			
10-Jul-06	982.39	1.01	983.40
9-Aug-06	982.39	1.24	983.63
STG-5			
10-Jul-06	978.32	1.67	979.99
9-Aug-06	978.32	1.13	979.45
STG-6			
10-Jul-06	981.77	1.20	982.97
9-Aug-06	981.77	0.85	982.62

NOTES:

STG = Staff gauge
ft = Feet
ft msl = Feet above mean sea level

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APPENDIX A
BORING LOGS AND WELL CONSTRUCTION DIAGRAMS



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Columbus, OH 43240

Phone 614-540-6633 Fax 614-540-6638

BOREHOLE/WELL NO.: **B-1**

TOTAL DEPTH: **14.5'**

PROJECT INFORMATION

DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **5/15/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER:
GROUND/TOC ELEVATION:

☒ Water level during drilling

☒ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	0			0-0		MINE SPOIL: Dark gray to black with little tan clay with some silt and shale fragments	
2	5-10	6	00		1-1 2-2 3-3 4-4 5-5 6-6 7-7 8-8 9-9			
3	10-15	40	0000		10-10 11-11 12-12 13-13 14-14		Buff with some rust color with some coal fragments, very high plasticity Refusal @ 14.5' (coal)	

OBSERVATIONS East side of AOI 5-7



8740 Orion Pl., Suite 100
Columbus, OH 43240

Phone 614-540-6633 Fax 614-540-6638

BOREHOLE/WELL NO.: **B-2/PZ-1**

TOTAL DEPTH: **20'**

PROJECT INFORMATION

DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **5/15/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER: **2"**
GROUND/TOC ELEVATION: **TOC 1109.62**

☒ Water level during drilling

☒ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	30	0 0 0 0		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20		<p>TOPSOIL: Brown TOPSOIL, wet</p> <p>MINE SPOIL: Gray CLAY with tile fragments, very high plasticity</p> <p>Layer of some intermixed blue and pink color</p> <p>Layer of glass</p> <p>Brown and dark gray mottling, some silt and rock frags</p> <p>SANDSTONE: Highly oxidized SANDSTONE and coal</p>	
3	5-10	24	0 0 0 0					
4	10-15	60	0 0 0 0					
	15-20	32	0 0 0 0					

OBSERVATIONS South side of AOI 5-7



8740 Orion Pl., Suite 100
Columbus, OH 43240

Phone 614-540-6633 Fax 614-540-6638

BOREHOLE/WELL NO.: **B-3**

TOTAL DEPTH: **9'**

PROJECT INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **5/16/06**

DRILLING INFORMATION

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER: **8"**
GROUND/TOC ELEVATION:

☒ Water level during drilling

☒ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	58	0 0 0 0		0-0 1-1 2-2 3-3 4-4		MINE SPOIL: Light brown to brown silty clay with fine to coarse gravel and trace fine to coarse sand, moist	
2	5-10	38	0 0 0 0 0		5-5 6-6 7-7 8-8 9-9		Dry, some coal fragments Pale/buff colored mottling, with highly oxidized sandstone fragments Refusal @ 9' (sandstone)	



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BOREHOLE/WELL NO.: **B-4**

TOTAL DEPTH: **43'**

PROJECT INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **5/16/06**

DRILLING INFORMATION

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER:
GROUND/TOC ELEVATION:

≠ Water level during drilling

≠ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	34	0		0 - 0		MINE SPOIL: Light brown clayey silt with fine to coarse gravel, low plasticity	
			0		1 - 1			
			0		2 - 2			
			0		3 - 3			
			0		4 - 4			
2	5-10	22	0		5 - 5		Gray, with shale fragments	
			0		6 - 6			
			0		7 - 7		Brown, with sandstone fragments	
			0		8 - 8			
			0		9 - 9			
	10-15	21	0		10 - 10			
			0		11 - 11			
			0		12 - 12			
			0		13 - 13		Layer of tile fragments	
			0		14 - 14		Brown clay with coarse gravel and shale fragments, moist, high plasticity	
4	15-20	41	0		15 - 15			
			0		16 - 16			
			0		17 - 17			
			0		18 - 18			
			0		19 - 19			
5	20-25	37	0		20 - 20			
			0		21 - 21			
			0		22 - 22		SHALE: Weathered SHALE	
			0		23 - 23			
			0		24 - 24			
6	25-30	41	0		25 - 25		MINE SPOIL: Dark and light brown with some orange mottling silt and clay with sandstone, shale, and coal fragments	
			0		26 - 26			
			0		27 - 27			
			0		28 - 28			
			0		29 - 29			
7	30-35	43	0		30 - 30			
			0		31 - 31			
			0		32 - 32			
			0		33 - 33			
			0		34 - 34			
8	35-40	32	0		35 - 35			
			0		36 - 36			
			0		37 - 37			
			0		38 - 38			
			0		39 - 39			
9	40-45	20	0		40 - 40			
			0		41 - 41			
			0		42 - 42			
			0		43 - 43		Refusal @ 43' (coal)	



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BOREHOLE/WELL NO.: **B-5**

TOTAL DEPTH: **17'**

PROJECT INFORMATION

DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **5/16/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER:
GROUND/TOC ELEVATION:

☒ Water level during drilling

☒ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	60	0 0 0 0		0—0 1—1 2—2 3—3 4—4		MINE SPOIL: Brown silty clay with gravel and rock fragments intermixed with gray clay and bright colored material	
2	5-10	37	0 0 0 0		5—5 6—6 7—7 8—8 9—9			
3	10-15	34	0 0 0 0		10—10 11—11 12—12 13—13 14—14		Tile fragment	
4	15-20	6	0 0		15—15 16—16 17—17		Refusal @ 17' (shale)	



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BOREHOLE/WELL NO.: **B-6**

TOTAL DEPTH: **25'**

PROJECT INFORMATION


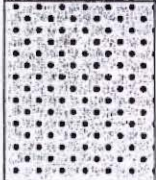
DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/12/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER:
GROUND/TOC ELEVATION:

☒ Water level during drilling

☒ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	30	0 0 0 0		0-0 1-1 2-2 3-3 4-4 5-5 6-6 7-7 8-8 9-9 10-10 11-11 12-12 13-13 14-14 15-15 16-16 17-17 18-18 19-19 20-20 21-21 22-22 23-23 24-24 25-25		MINE SPOIL: Light brown, brown, gray, and tan with some orange mottling silty clay with fine to coarse sand and gravel, with rock and tile fragments	
2	5-10	32	0 0 0 0					
3	10-15	22	0 0 0 0					
4	15-20	7	0 0					
5	20-25	10	0 0				SANDSTONE: Gray coarse-grained SANDSTONE	



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BOREHOLE/WELL NO.: **B-7**

TOTAL DEPTH: **5'**

PROJECT INFORMATION



DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/12/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER:
GROUND/TOC ELEVATION:

☒ Water level during drilling

☒ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	33	0 0 0 0		0-0 1-1 2-2 3-3 4-4 5-5	 MINE SPOIL: Brown and light brown with some orange mottling clayey silt with fine to coarse sand and gravel and rock fragments	 SANDSTONE: Weathered SANDSTONE	



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BOREHOLE/WELL NO.: **B-8**

TOTAL DEPTH: **14.5**

PROJECT INFORMATION

DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/12/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER:
GROUND/TOC ELEVATION:

☒ Water level during drilling

☒ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	58	0 0 0 0		0—0 1—1 2—2 3—3 4—4		<p>MINE SPOIL: Gray with light brown mottling clayey silt with some fine to coarse gravel and rock fragments</p> <p>Light and dark brown with orange mottling, with some coal fragments</p>	
2	5-10	60	0 0 0 0		5—5 6—6 7—7 8—8 9—9		<p>Less coal, predominantly silt with clay nodules</p>	
3	10-15	51	0 0 0 0		10—10 11—11 12—12 13—13 14—14		<p>Pale gray with some light brown</p> <p>Refusal @ 14.5'</p>	



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BOREHOLE/WELL NO.: **B-9**

TOTAL DEPTH: **19'**

PROJECT INFORMATION


DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/13/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER:
GROUND/TOC ELEVATION:

☞ Water level during drilling

☞ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	0			0		 <p>MINE SPOIL: Brown, light brown, gray, and light gray with some orange mottling clay and silt with fine to coarse gravel and rock fragments</p> <p>Refusal @ 19'</p>	
					1			
					2			
					3			
					4			
4	5-10	0			5			
					6			
					7			
					8			
					9			
3	10-15	26	0 0 0 0		10			
					11			
					12			
					13			
					14			
4	15-20	55	0 0 0 0		15			
					16			
					17			
					18			
					19			

OBSERVATIONS East side of AOI 5-6



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BOREHOLE/WELL NO.: **B-10**

TOTAL DEPTH: **11'**

PROJECT INFORMATION

DRILLING INFORMATION


PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/13/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER:
GROUND/TOC ELEVATION:

≈ Water level during drilling

✕ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
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1	0-5	50	0 0 0 0		0 1 2 3 4 5 6 7 8 9 10 11		<p>TOPSOIL: Brown TOPSOIL and tile fragments</p> <p>MINE SPOIL: Light and dark brown with some gray mottling clayey silt with fine to coarse gravel and rock fragments</p>	
2	5-10	58	0 0 0 0				Little clay	
3	10-15	12	0 0				Some clay	
							Refusal @ 11' (shale)	

OBSERVATIONS West side of AOI 5-3



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BOREHOLE/WELL NO.: **B-11/PZ-2**

TOTAL DEPTH: **35'**

PROJECT INFORMATION

DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/13/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA w/ 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER: **2"**
GROUND/TOC ELEVATION: **TOC 984.63**

≈ Water level during drilling

≠ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	0			0 — 0		MINE SPOIL: Light brown sandy silt with gravel and rock fragments	
					1 — 1			
					2 — 2			
					3 — 3			
					4 — 4			
2	5-10	17	0		5 — 5			
			0		6 — 6			
			0		7 — 7			
					8 — 8			
					9 — 9			
3	10-15	54	0		10 — 10			
			0		11 — 11			
			0		12 — 12		Light brown, dark brown, and gray with some orange mottling clayey silt with fine to coarse gravel and rock fragments	
			0		13 — 13			
					14 — 14			
4	15-20	42	0		15 — 15			
			0		16 — 16		Some gray clay nodules	
			0		17 — 17			
			0		18 — 18			
					19 — 19			
5	20-25	31	0		20 — 20			
			0		21 — 21			
			0		22 — 22			
			0		23 — 23			
					24 — 24			
6	25-30	30	0		25 — 25		Intermixed shale	
			0		26 — 26	≈	Layer of clayey sand, wet	
			0		27 — 27			
			0		28 — 28			
					29 — 29			
7	30-35	60	0		30 — 30			
			0		31 — 31			
			0		32 — 32			
			0		33 — 33			
					34 — 34			
					35 — 35			



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BOREHOLE/WELL NO.: **5-5-SB-2**

TOTAL DEPTH: **20'**

PROJECT INFORMATION

DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/14/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA / 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER: **2"**
GROUND/TOC ELEVATION: **TOC 1028.03**

✕ Water level during drilling

✕ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	17	0 0		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20		<p>TOPSOIL: Brown TOPSOIL</p> <p>MINE SPOIL: Gray with some brown clay with some silt and tile fragments</p> <p>Some wood fragments Intermixed fine to coarse gravel, wet</p>	
3	10-15	40	0 0 0 0					
4	15-20	51	0 0 0 0					

OBSERVATIONS Temporary Well Installed (5-5-TEMP-WELL)



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BOREHOLE/WELL NO.: **5-7-SB-3**

TOTAL DEPTH: **20'**

PROJECT INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/15/06**

DRILLING INFORMATION

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA / 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER: **2"**
GROUND/TOC ELEVATION: **TOC 1106.00**

≈ Water level during drilling

✕ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	18	0 0 0		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20		MINE SPOIL: Gray silty clay with tile fragments	
	5-10	22	0 0 0 0				Less silt, some intermixed buff colored material	
3	10-15	19	0 0 0 0					
4	15-20	20	0 0 0 0				Intermixed fine to coarse-grained sand	



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BOREHOLE/WELL NO.: **5-9-SB-2**

TOTAL DEPTH: **16.5'**

PROJECT INFORMATION

DRILLING INFORMATION

PROJECT: **United States Ceramic Tile**
SITE LOCATION: **East Sparta, Ohio**
PROJECT NO.: **060-770**
FIELD GEOLOGIST: **C Flaherty**
DATES DRILLED: **6/16/06**

DRILLING CO./DRILLER: **Frontz Drilling**
DRILLING RIG/METHOD: **4.25" HSA / 5' Sampler**
BOREHOLE DIAMETER: **8"**
WELL DIAMETER: **2"**
GROUND/TOC ELEVATION: **TOC 1016.07**

☒ Water level during drilling

☒ 24 hrs water level after development

SAMPLE #	SAMPLE INTERVAL	SAMPLE RECOVERY (in)	PID During Drilling	Blow Count	DEPTH ELEVATION	SOIL SYMBOLS	LITHOLOGY	WELL COMPLETION
1	0-5	14	0 0 0		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16		MINE SPOIL: Brown silt with rock and tile fragments	
2	5-10	30	0 0 0 0				Gray clay with little silt and tile fragments	
3	10-15	25	0 0 0 0					
4	15-20	34	0 0 0 0				Some brown mottling Refusal @ 16.5'	

OBSERVATIONS Temporary Well Installed (5-9-TEMP-WELL)

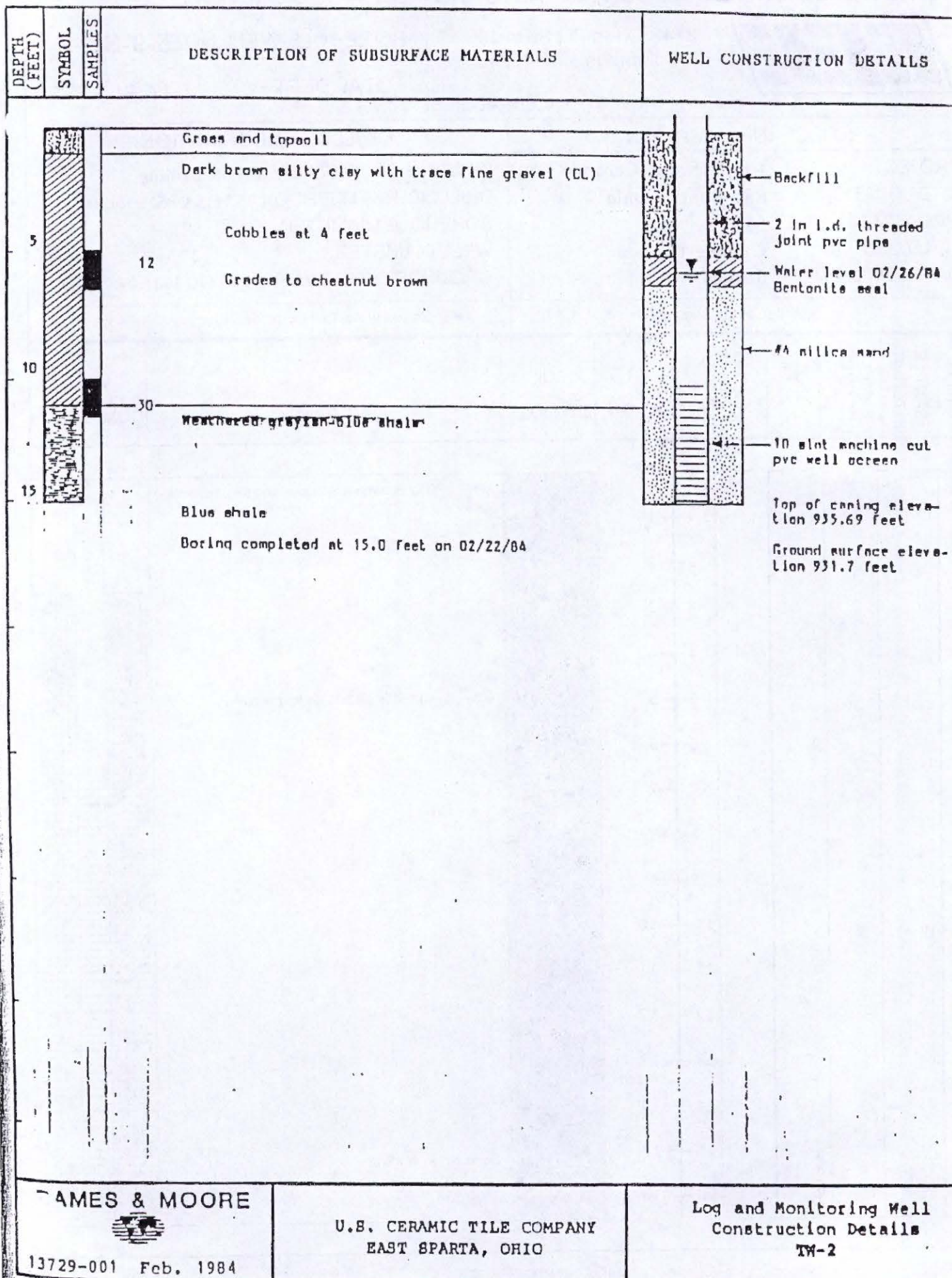
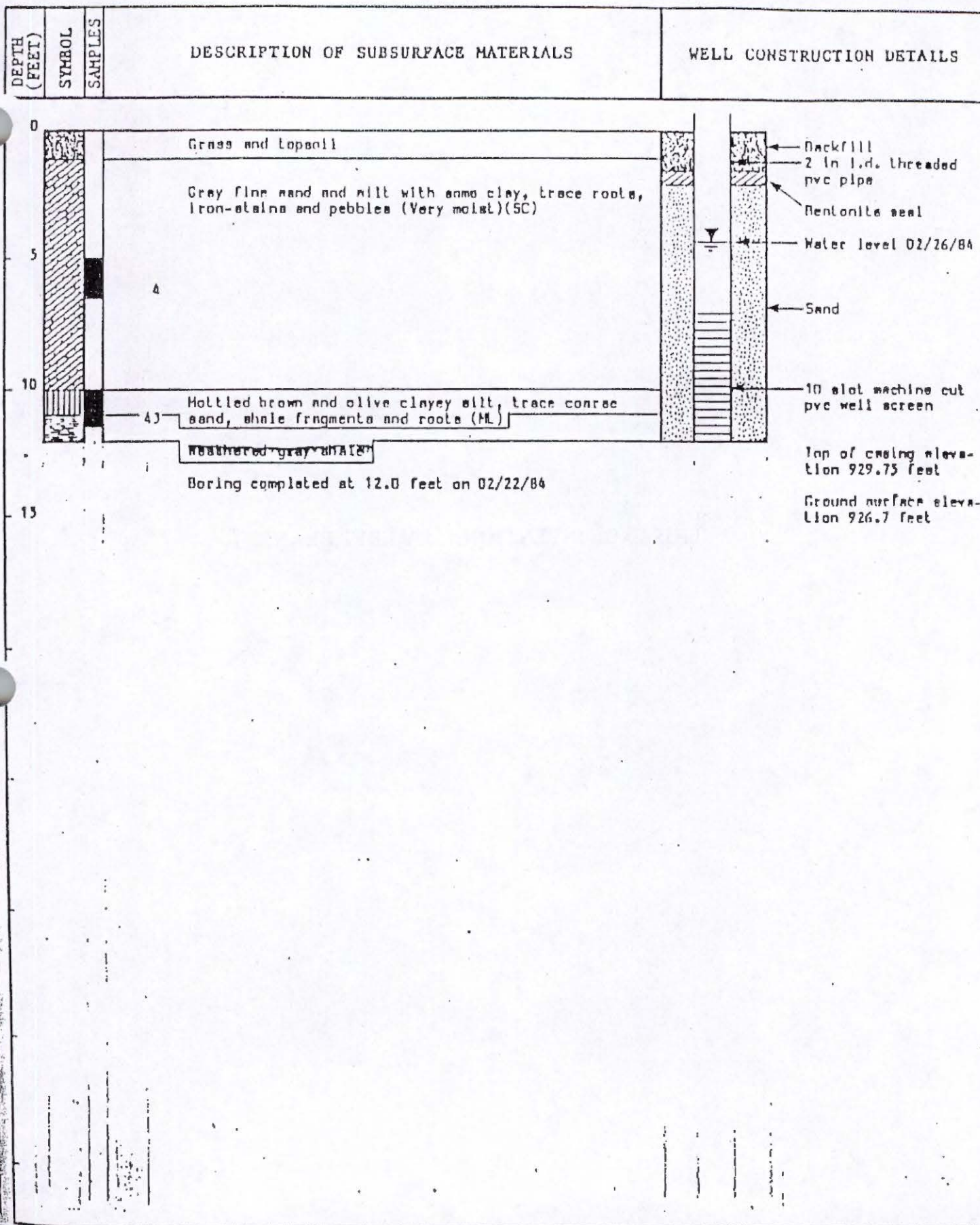


FIGURE B-3



DAMES & MOORE



13729-001 Feb. 1984

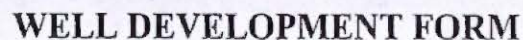
U.S. CERAMIC TILE COMPANY
EAST SPARTA, OHIO

Log and Monitoring Well
Construction Details

TW-3

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APPENDIX B
WELL DEVELOPMENT FORMS



Casing Volume (g): 0.18

Well Volumes Removed: _____

[illegible]



Project No.: 051-840
Date: 6/23/2006
Developed By: CF/JK
Purge Method: Dis. Bailer / Whaler
Total Gallons Removed: 35.0
Well Volumes Removed: 25.0

[illegible]



Casing Volume (g): 2.27

Well Volumes Removed: 20.7

[illegible]

6/23 calibrations

48

$$4.00 = 4.00$$
 $10.00 = 10.00$ $14/3 = 4.67$

1124

5/11/57

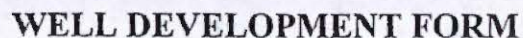
$$510 = 51 \cdot 10 \quad 490 = 70 \cdot 7$$



Casing Volume (g): 2.35

Well Volumes Removed: 20.6

[illegible]



Project No.: 051-840
Date: 6/12/2006
Developed By: J/K/CT
Purge Method: Dr. Bailer / Water
Total Gallons Removed: 33.0
Well Volumes Removed: 59.3

[illegible]